Railroad Age Gazette

DAILY EDITION

Vol. XLVI. NEW YORK—JUNE 23, 1909—ATLANTIC CITY. No. 25D.

PUBLISHED DAILY BY
THE RAILROAD GAZETTE (INC.), 83 FULTON STREET, NEW YORK.
On the occasion of the Annual Convention of the Master Car Builders' and American Railway Master Mechanics' Associations.

CHICAGO: 160 Harrison St. PITTSBURGH: Farmers' Bank Bldg.
LONDON: Queen Anne's Chambers, Westminster.

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Subscription, including regular weekly issues and special daily editions published from time to time in New York, or in places other than New York, payable in advance and postage free.

United States and Mexico.....$5.00 a year
Canada.....$6.00 a year
Foreign Edition, London.....£1 12s. ($8.00) a year
Single Copies.....15 cents each

If mailed from Atlantic City the postage on this copy of the *Daily Railroad Age Gazette* is seven cents. Unles the full amount is affixed to the wrapper or envelope, the post office will not forward the poper.

Application made at the Post Office at New York for entry as mail matter of the second class.

It seems strange that standard dimensions for air brake hose couplings have not been adopted long ago, and it will surprise many that the couplings made by the two brake manufacturers are not exactly alike, and that the rubber gasket suitable for one is not best for the other. The same gaskets have been used indiscriminately, but they do not fit as accurately as they should and this often results in a leaky joint. It is high time, therefore, that a common standard hose coupling and gasket should be adopted, and the brake companies should help establish the standard as rapidly as possible by replacing odd and old couplings which are worn or sightly damaged by the new standard at a small charge. The establishment of this standard hose coupling will be a credit to the work of the brake hose committee for this year, but the quality of the hose itself is too important to be allowed to rest with present specifications. The strength tests which have been prescribed do not ensure the desired life. Some hose which meets M. C. B. specifications does not wear well, and other hose which does not meet specifications is sent from the factory with the M. C. B. badge on it. The necessity for some method of ascertaining the purity of the gum used in brake hose is increasing, and next year the committee could ascertain what progress is being made in such investigation and report the prospect and progress. It is a general rule that when sufficient effort is directed to a problem it yields to solution, and the hose problem is big enough to warrant continued research.

The defects in cast iron wheels which result from the heating due to severe brake application, commonly known as brake burns, bring up questions relating to the definition of the defects, the responsibility of the car owner and to the possible means of overcoming to some extent the cause of such defects. There is a wide difference of opinion in regard to these questions, and in the topical discussion at Monday's session, an effort was made to demonstrate that wheels which fail in this way are not made of the proper material, and the defect is one for which the car owner should be responsible. The subject was referred to the arbitration committee for report at this convention, but it ought to be evident that a new problem of this kind cannot be settled in a summary manner, which has only the advantage of opinions, and it must remain an unsolved one until more facts are brought out by experiment and special investigation. H. D. Taylor gave an account of an experiment made with a heavily loaded train run down a grade with hand brakes first applied, and followed by application of the air brakes so regulated as not to slide the wheels. They were thus overheated, but not slid flat or shelled out and some of the plates were cracked. The spots known as brake burns were not produced and it is claimed that this was because the wheels were made with a mixture of good metals. The inference to be drawn from this single experiment is that cast iron wheels when made of high grade material properly mixed will not be injured by severe application of the brake which do not slide the wheels, and those which are so injured as to be brake burned should be paid for by the car owner. It is more likely that brake burns are produced by the heating due to sliding and that cast wheels of good quality will be injured in this way. The subject is an important one, and should be further investigated by a committee. When more facts are obtained it will then be possible to define the defect properly, and to decide who should pay for the damage.

ENGINE ECONOMIES.

After discussing mechanical stokers and having come to the conclusion that they have been developed about up to the point of commercial desirability, the fuel question was attacked and discussed in the meeting of Friday. It is apparently very difficult to say much of anything that is new on this subject, as the laws of combustion are so well known that almost any discussion will appear to be elementary. And so, the presentation and discussion of the subject of fuel economies was limited almost entirely to the subject of the education of the fireman, and the best type of fireman to engage, in order to get results that can only be obtained by mixing brains with the work. It is curious, however, in the light of recent publications in which the results of purchase of coal by heating quality by the government have been given, that the compilers of the paper and those who discussed it failed to make any recognition of the economies that have been so obtained. To be sure, the government uses no fuel in any quantity, in the way that it is used on locomotives, but if it pays to buy coal in that way for all manner of service from the boiler of a torpedo-boat with its forced draft, to the stove in the barracks of an outport, it seems as though it were at least worth trying on railways for locomotive work.

As it stands, there is not an item in the long list of 26 points given that has not been attacked again and again, until fresh data is almost impossible to obtain. Apparently the matter is now one of men. The principles of combustion being known, the main thing to be done is to get them applied, and for that the men must not only be educated, but must be educated in a way that will cause them to take an interest in their work. This is what makes the trouble!

What has been said of fuel economies holds equally well in the field of lubrication. We know perfectly what has to be done in order to get a journal to run well in any position. We know what effect the different grades of oil will have upon the rubbing surfaces, and what must be done in order to get satisfactory results with varying steam pressures in the cylinders, and that special and readily procurable grades of oil must be used for high-pressures and superheat. And it has also been pretty well ascertained what the minimum consumption can be reduced to. Hence, discussion along these lines is rather useless, and again the question is resolved into the man. It is, therefore, rather a waste of time to discuss ordinary methods of physical applications of the lubri-

cant, when it is the man who needs looking after. If this is really the true point of view from which this question of economies must be studied, it is the social aspect of the problem that should be presented, and it is the man who has put into practice some effective method of tuning his men up to their work and keeping them there who should be welcomed into the discussion.

At a railway club meeting some time ago, the late M. N. Forney, suggested that the limit of elasticity of the audience had been passed. And it is well known that if a piano string is suddenly raised from a lower to a higher pitch it will flatten or drop back and it is only after a long continued effort to hold it at the higher pitch that it will remain there. Men are not altogether different from materials, and it is quite within the bounds of reason to expect a flattening of the efforts of the engineer and fireman if they are only occasionally keyed up to concert pitch. To effect an economical use of coal and oil is not only a matter of teaching the man, so that, like the Athenians he may know what is right, but so to train him that like the Lacedaemonians he may practice it. And who is the man that can tell us how to do it?

STEEL PASSENGER CAR DESIGN.

The majority of the passenger cars ordered this year are either all-steel or have steel underframes; and as this type of car construction is yet in the state of development, there is still much variation in the designs for different railways and by different builders. The most prominent and radical change from the ordinary designs for steel underframes as previously used, is seen in the more extensive use of cast steel. Commencing with the elementary detail, the end sill, it has extended to the double body bolster, then to the end platform, and has gradually consolidated all these in one complete casting, and, not stopping at this, the rear bolster, has extensions which are carried some distance back to receive the rolled steel sills. An illustration of this extensive use of cast steel for underframe ends will be seen in the detail of the new Jersey Central coaches which is illustrated on another page.

The heavy platforms, drawbars, draft rigging vestibule, as well as the inside equipment of the bar at the ends, balance a portion of central part beyond the bolsters, and a diagram of the bending moments for steel underframes of sleeping cars shows that splices can be safely used several feet back of the rear bolster. This has been an important factor in recent Pullman designs, and the new steel sleepers for the Pennsylvania Railroad will have the combined cast steel and rolled steel underframes with splices some distance back of the bolster. The heavy sections used in the large end casting make a very strong construction, but in spite of the extra weight of this portion the total weight of the new sleepers will be materially less than that of the first steel sleeper, the "Jamestown," which has been in regular service during the past year.

Many of the steel coaches already built have the side posts and carlines continuous and integral, and while this may be an ideal feature in the finished car, it is not convenient during the process of construction. It requires the men to work at a disadvantage with much of their material overhead, and the cost of labor is excessive. In the new designs the side posts and carlines are separate, and this permits the sides to be built without the interference of the roof material. The complete steel upper and lower deck can then be built independently on the shop floor and, when completed, can be hoisted bodily and placed in position on the posts.

Another change which is seen in recent Pullman practice dispenses with the continuous steel plate girder under the windows which has been used extensively in previous practice. The car side is stiffened by short diagonal angle iron braces and the outer finish is made up of the cellular metallic sheathing which was illustrated in the *Railroad Age Gazette*, May 15, 1908. This material supplies the desired insulating and fireproof qualities and takes care of the expansion, which, is a continuous plate, amounts to about ½ in. in extremes of temperature. The cellular feature of the sheathing provides air spaces between the inner and outer walls, making a good insulation against heat and cold, while there is not sufficient local expansion or contraction to cause the spreading of seams. This form of metallic siding also has some advantages in painting and maintenance. It is furnished with two priming coats of paint baked on, which makes it more durable, and when it is applied the car is immediately ready to receive the body color and varnish, thereby saving considerable time in the paint shop. When any small surface of this side finish is scratched or injured it can be more readily repaired and painted than a solid steel sheet.

The experience with large steel coaches has shown that improvement should be made in the fireproof and insulating materials used for inside finish and some new and better materials for this purpose are now available. The large order for Southern Pacific coaches is being filled with cars of their own design, with semi-elliptical roof and no upper deck, thus indicating that this form of construction can be made satisfactory for American practice. The principal difficulty with it has been the ventilators; and these have been so improved as to give satisfactory results.

ANTI-FRICTION CENTER PLATES AND SIDE BEARINGS.

The prospect of obtaining definite information in regard to the friction of center plates and side bearings on freight cars, which was held out by the results of the last convention, has been disappointed by the report of the committee just presented. It was thought that during the dull times the railways would find opportunity to make investigations of the conditions affecting economical operation, but the managers have apparently been so embittered by reduced revenues that they would not consent to expenditures which were not directly productive of profit. It is probably for this reason that the committee has not been able to carry out the instruction.

The principal objection to roller bearing center plates is based on the fact that there is comparatively little motion of the plates in curving, and that flat plates answer the purpose very well even under heavy loads. Another objection is that on account of this small motion the balls or rollers remain in one position most of the time or have a small range of movement, and under constant heavy pressure they tend to wear cavities in the plates, which prevent their free action when a sharp curve is passed over. This has been the experience with some of the anti-friction center plates which have been tested in service, and it is an objectionable feature which it is difficult to overcome. While it is true the motion of center plates even on sharp curves is slight, the initial friction is so great that when multiplied by the small distance traveled it represents considerable work. Unlubricated plates of soft material, like malleable iron or soft steel, will imbed under excessive pressure and the initial resistance to curvature must then be great, probably 3,000 lbs. at an arm of 31 inches under a 50-ton loaded car.

The rapid wear of wheel flanges under 50-ton steel cars has caused some of the larger lines to use solid steel wheels as a measure of safety, but if no attention is given to center plate and side bearing friction, the same conditions which caused sharp flanges on chilled cast iron wheels will produce them in a shorter time on the rolled steel wheels. The frequent turning of these wheels and the time lost in replacing them will be an expensive item, which would warrant a considerable expenditure for anti-friction center plates and side bearings.

The practice of one large western line in lubricating center plates is to use flake graphite, costing about 6 cents per pound. Whenever a car body is raised from the trucks, about 2 oz. of graphite is spread over the truck center plate. A small measure, 2 in. in diameter and 2 in. high, is used for this

purpose. This dry lubricant is pressed into the metal plate, filling up irregular spaces and after a little wear creating a smooth surface which moves with much less friction than the rough dry plate or a plate lubricated with ordinary grease. The cars which are so treated are stenciled, and the practice of lubricating center plates is regularly followed up. Another indication of the growing tendency in favor of center plate lubrication is seen in some new designs which have oil reservoirs and provision for filling them without lifting the car body.

In such an important detail as the center plate for high capacity cars, it is surprising that so little attention is paid to the finish of the bearing surfaces; in fact, they seldom receive any finish, but are placed together and go into service about as they come from the foundry or hydraulic press. If it is not thought sufficiently important to go to the expense of using anti-friction rollers, the simpler ways of reducing friction by the use of smooth surfaces and lubrication should become more general. The cast plates should be ground down to a smooth bearing by a slight expenditure and they should then be thoroughly cleaned by removing all emery or other gritty material which might remain from the grinding wheel. With smooth bearing surfaces well lubricated the friction of center plates would be materially reduced, and the next improvement should be to provide such construction in the bolsters and side bearings that the top and bottom plates will remain parallel and will not be allowed to cant and concentrate the load on one side of the plate. This condition has been greatly improved by the stiff bolsters used in steel cars, but the larger motion of the bolster at side bearing calls for something better than the ordinary plain rubbing surface.

The investigation contemplated by the appointment of the committee should not be given up, but experiments should be made to determine the resistance of loaded trains with the ordinary plain side bearing with ¼ in. to ⅜ in. space on a side, and with the best of the anti-friction side bearings which have little or no vertical motion and which tend to keep the center plates parallel.

We print to-day a letter from the Railway Supply Manufacturers' Association, from which we beg leave to dissent. The writers surely do not mean to imply that it is the "usual American way" to elect candidates for office without any previous discussion in the papers. It is very important that differences of opinion should arise among the electorate, and the papers play an enormously important part in starting people thinking, and in bringing into clear, tangible form those differences; whether or not a published letter is signed, is of no ethical consequence. A signed letter from a well-known man carries more weight; that is all. As far as the subject matter of the Supply Man's letter is concerned, we wonder which part of it was especially "deplored" by the association. Did the association deplore the statement that "it behooves us to elect broad, liberal-minded men, who are high in the courts of their own companies, who will accept the offices not for the honor which accrues, or in order to please their friends and grind axes by favored appointments, but in order to keep the standards of the association on a broad, high level?" Or did the association consider as "prejudicial to the best interests and good-fellowship of the supply representatives at these conventions" our correspondent's statement that "we want * * * railway officers * * * to feel that our officers are distinguished men; * * * distinguished in ability, technical training, tactfulness, character and high standing in the communities where they live and in the councils of their respective concerns?" We do not believe the association meant to dissent from either of those propositions, and we think that as soon as the smoke and turmoil has cleared away it will be disposed to support us in our contention that frank, outspoken criticism is a most wholesome thing, and is one of the best-known invigorators for governments and associations alike.

THE SUPPLY MANUFACTURERS' ELECTION.

Atlantic City, June 21, 1909.

TO THE EDITOR OF THE DAILY RAILROAD AGE GAZETTE:

As instructed, I send you below copy of a resolution adopted by our Executive Committee to-day, referring to the article entitled "The Supply Manufacturers' Election," published in your daily issue of June 18, 1909:

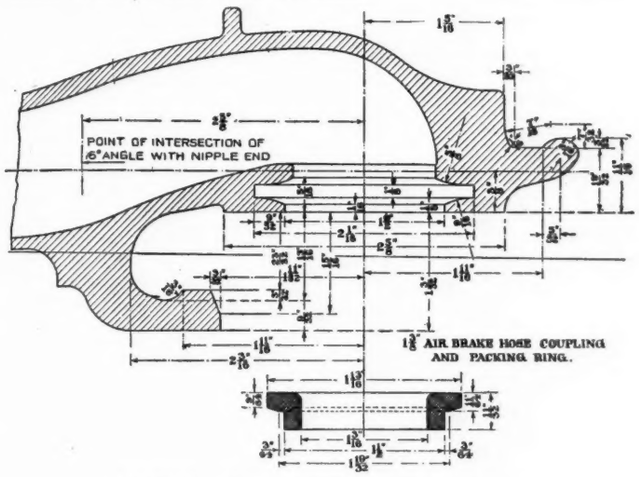
"*Resolved*, That it is the sense of the Executive Committee that the publication in the *Daily Railroad Age Gazette* of an anonymous communication regarding the election of officers of this association is to be deplored, and that its publication is considered by this committee as prejudicial to the best interests and good fellowship of the Supply representatives in attendance upon these conventions.

Differences of opinion regarding candidates will naturally arise, which can be settled in the usual American way of submitting the question to ballot, but such differences should not be emphasized or aggravated by discussion in the papers, and particularly by those unwilling to assume the responsibility therefor.

E. G. F. SMITH,
Secretary, The Railway Manufacturers' Association.

AIR-BRAKE HOSE.*

The committee strongly recommends that railways make extensive experiments with devices designed to distribute the bending strain over nipple end of hose and afford protection from the damage by being struck with coupling when hose are uncoupled under pressure, without parting by hand. This latter condition of damage might be considerably reduced by some improvements in the design of hose coupling which would materially decrease the strains of uncoupling when parted under pressure other than by hand.



Air-Brake Hose Coupling and Gaskets.

Upon request of the Executive Committee it submits recommendations for standard dimensions of air-brake hose couplings and gaskets.

It also recommends the following change in Rule 33, page 17: Omit "and hose applied without swelled end and not conforming to M. C. B. Standard hose," making it read:

"Cars equipped with air-brake hose other than M. C. B. Standard, on and after June 1, 1909, except 1¼-in. M. C. B. Standard hose and so branded, which hose has been manufactured previous to June 1, 1909." — Owners responsible.

"Except cars offered in interchange, where delivering company is responsible." — Delivering Company responsible

The recommendation in regard to change in Rule 33 is made on account of the fact that under the present rule old M. C. B. Standard 1¼-in. hose would not be permissible after June 1, 1909. This change is suggested to clear up a misunderstanding relative to this question.

This recommendation has been referred to the Arbitration Committee.

*Report presented at the annual convention of the Master Car Builders' Association. Committee: Le Grand Parish (chairman), J. Milliken, R. W. Burnett, J. R. Onderdonk, J. A. Carney.

THE GOLD BADGE BRIGADE.

At the 1908 annual meeting of the Railway Supply Manufacturers' Association someone suggested that the services of the retiring presidents of that association should be recognized in somewhat the same way as the past presidents of the Master Car Builders' and American Railway Master Mechanics' associations had been honored—by a suitably engraved gold badge. The idea was taken up by the Executive Committee, with the result that at a meeting of that committee in New York city November 20 last, R. T. Walbank (Glidden Varnish Company), President of the association for 1907-8, was presented with a badge in design like the one shown herewith. It was decided further not only to present badges of like design to all future retiring presidents, but to pay tribute in this same fitting way to all those who had served as chief executive officers of the association since its start on a permanent basis in 1901.

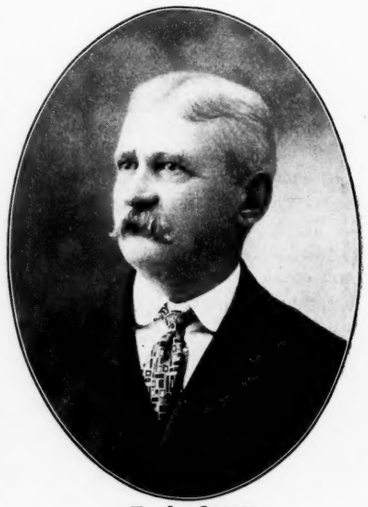
The nucleus of the present splendid business organization was formed by a circle of well-known supplymen who were well acquainted with the difficulties of conducting the exhibit and entertainment features of the annual conventions of the two important and rapidly growing mechanical associations and who foresaw ultimate chaos unless these affairs were put on a substantial business footing. Some of the members of this original band of conspirators will be found among those whose portraits accompany this article; but the incident should not be closed without recalling the names of some of the others.

It might not be amiss to refer to Harry W. Frost as "Arch Conspirator." As he has already been assigned to a niche no further comment is necessary. However, his ever-ready partners in crime should be brought into the limelight. They included Albert Waycott, D. C. Noble, A. J. Skeevers, J. M. Hopkins, George H. Bryant, W. S. McGowan, E. H. Baker, B. F. Pilson, O. C. Gayley, I. H. Munford, Charles L. Harris, W. E. Bryant and Charles Conlisk. The rank and file included a motley crowd of near conspirators, but most of their superiors have been mentioned—or will be.

Harry W. Frost.

At the annual meeting on Saturday last, gold badges were presented to all those whose pictures accompany this article, with the exception of the late Mr. Martin—"Charlie Martin" as he was known familiarly to many of us. The badge engraved for him was turned over to his family. The list included one other past Chairman—Scott H. Blewett, of the American Car & Foundry Co. Mr. Turner, the retiring President, whose likeness we reproduced in the first issue of this year's "Daily," also received his badge before the adjournment of the meeting.

Fred. A. Casey, Ashton Valve Company, was Chairman for 1900-01, and his assocites on that committee, the first under the business organization which had now developed under the leadership of the Chairman for the year previous, Harry W. Frost, were: D. C. Noble, W. C. De Armond, W. A. Smith and W. R. Gravener, who drew one year terms, and George H. Bryant, E. A. Simmons and Scott Blewett, who were selected by lot to serve two years. Mr. Casey's principal work was to perfect the new organization, and he did a splendid job.



F. A. Casey.

Scott H. Blewett was Chairman for 1902-03. And a memorable year it was! Somebody decided that the 1903 convention ought to be held at Mackinac Island, a resort located somewhere in Michigan. For awhile there was a dead calm; but after considerable rumbling, accompanied by flashes of hell-fire, the storm broke over St. Louis, the home of the alluring Mackinac Island hotel man—and Scott Blewett. There were great doings for awhile, until Mr. Blewett, backed by a corps of willing helpers, succeeded in convincing the hotel proprietor that he couldn't pack four men in every single room and from eight to an unknown maximum in the other rooms available, even if the beds were plainly labeled "A," "B," "C," etc., so that everyone would know just where to lay his weary head. Then it was easy, if somewhat humiliating; but the Executive Committee of both railway associations were amenable to reason and decided to change the place of meeting to Saratoga. The other members of the committee for that year, in addition to the holdovers, Messrs. Casey, Bryant and Simmons, were George A. Post, John T. Brown, J. G. Hendrickson and Frank Coolidge.

George A. Post succeeded Mr. Blewett. Of course, everybody knows Mr. Post. People used to refer to him as President of the Standard Coupler Company; but since he got mixed up with that Railway Business Association affair folks don't seem to know just where the "Colonel" stands. His platform, however, is still Standard, and it is a fact that he sometimes holds morning and afternoon Sessions that are given over almost exclusively to discussions of the brand of draft gear most dear to his heart. Mr. Post is in portly evidence at this convention, hovering between booths 339 and 4. Mr. Post had as associates on the 1903-4 committee, Messrs. John T. Brown, Hendrickson and Coolidge and Charles W. Martin Jr., S. F. Pryor, F. K. Shults and F. A. Barbey,

George A. Post.

One of the hardest workers for the success of the supply men's end of these annual conventions was Charles W. Martin,

Jr., who died December 31, 1907.

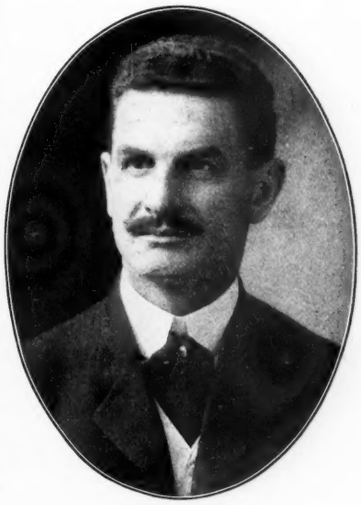
Charles W. Martin, Jr.

He was Chairman for 1904-05 and the honor was especially deserved. Mr. Martin, who represented Jenkins Bros., served in the ranks for a number of years, but his most conspicuous work before gaining the Chairmanship was as head of the Entertainment Committee. His principles were high and his nature was clearly reflected in his endeavors to uplift the standard of entertainment at the conventions. He succeeded, and his splendid work has been carried on and perfected. The members who served on the Executive Committee with Mr. Martin were Messrs. Pryor, Shults and Barbey and D. C. Noble, W. M. Simpson, J. F. Symington and Charles Herron.

F. K. Shults, American Steel Foundries, was Chairman for 1905-06. Nothing more serious than moving the convention to Atlantic City for the first time happened during his administration. But that was enough. In the first place, the mere mention of the place made people shake their heads. Just why, it would be hard now to recall; but at any rate there was quite some gloom. It was Fred. Shults' job to do the dispelling, and he came out pretty well. It took the whole committee, however, which consisted of Messrs. Noble, Simpson, Symington and Herron, who had had their troubles at Manhattan Beach the year before, and Mark A. Ross, W. B. Leach, James E. Minor and E. W. Hodgkins, to deal with the Atlantic City Hotel Men's Association. Not that Bell, of Chalfonte, and his band of persuasive satellites were hard and frigid; but they wanted to eat their cake and have it, too. Mr. Bell knows how to run a hotel and he also knows how to figure costs; and this knowledge, combined with a natural persistence in pursuit of game and a genial disposition, kept the committee guessing for some time. As to just which side won in that first Atlantic City battle has not been made public; but we do know that the convention was a success and that friend Bell still goes around with pockets full of formidable looking documents showing how much the Atlantic City Hotel Men's Association has lost to date in connection with the M. M. and M. C. B. conventions.

F. K. Shults.

Mark A. Ross, Pyle-National Electric Headlight Company, was the last head of the Executive Committee with the title of Chairman (1906-07). Of the several good jobs that he and his co-workers did toward the success of the 1907 convention, the transformation of the exhibition from a vari-colored circus in appearance into a substantial and businesslike miniature nesslike miniature World's Fair was by far the best. The plan involved several radical changes which met with much opposition at first by those who did not grasp the committee's object; and it took several weeks of hard educational work and much diplomacy to arouse enthusiasm among exhibitors. That the committee was right cannot now be questioned. The two succeeding committees have worked along the same lines, perfecting details here and there, as was to be expected, until we now have a layout that would be hard to criticize. With Mr. Ross on the committee were Messrs. Leach, Minor and Hodgkins and R. T. Walbank, George N. Riley, L. O. Cameron and F. L. De Armond.



Mark A. Ross.

At the 1907 convention a new constitution and set of by-laws were adopted. The latter provided for an Executive Committee of twelve instead of eight members and four executive officers—President, Vice-President, Treasurer and Secretary. The first three are elected from the membership of the Executive Committee. The Secretary is appointed.

OLD CONVENTION DAYS.

Through the courtesies of Daniel M. Brady, we have been able to reproduce the program of the Master Car Builders' Convention, held at Saratoga Springs, in 1884.

EIGHTEENTH

ANNUAL CONVENTION.

MASTER CAR BUILDERS' ASSOCIATION

CONGRESS HALL, SARATOGA.

1884.

On May 14, of that year, a meeting of what was then the Master Car Builders' Association, now the New York Railroad Club, was called at the association rooms, 113 Liberty street, New York. At this meeting, the executive committee was appointed. A number of the gentlemen present subscribed $100 each, and circulars were sent to supply firms, requesting

Cover of the Convention Program.

them to arrange for representation at the convention. It was also mentioned in these circulars that appropriations, similar to the ones made by the gentlemen at the meeting, were in order.

Of the nine gentlemen who were on the executive committee then appointed, six are dead. These include: J. Weymer, H. A. Rogers, T. W. Getman, J. T. Leighton, W. P. Seguine, and C. D'W. Gibson. W. W. Snow is an invalid at his home, unable to travel. J. Seaver Page and D. M. Brady are here to-day and as much alive as any persons at the convention.

J. Seaver Page was toastmaster at the dinner given to the "Master Car Builders of the United States," at Congress Hall, on June 12, 1884. Among the signatures seen on a dinner card of the occasion are those of J. M. Brady, D. M. Brady, Theodore Voorhees and Mrs. Voorhees, and Eugene Chamberlain and Mrs. Chamberlain.

It is interesting to note in connection with these conventions that some 210 firms are represented here to-day, with elaborate exhibits, while in 1884, just 44 firms were represented. No exhibits were shown at the 1884 convention, at

Programme of Entertainment.

Tuesday, June 10:—DRIVE TO GEYSER SPRING AND WOODLAWN PARK; MUSIC IN THE EVENING.

Wednesday, June 11:—EXCURSION TO SARATOGA LAKE AND WHITE SULPHUR SPRINGS—LEAVING THE HOTEL AT 3 P.M.

Thursday, June 12:—EXCURSION TO MOUNT McGREGOR—TO LEAVE HOTEL AT 3 P.M., BANQUET IN CONGRESS HALL AT 7 P.M.

MUSIC BY DORING'S BAND.

PARLOR W will be HEADQUARTERS of the Committee during the Convention.

Banquet Committee.

L. G. TILLOTSON,

RICHARD VOSE,

JOHN ASHCROFT,

JOSEPH J. WALTON,

M. T. MOORE,

(Representing A. BRIDGES.)

Reception Committee.

WHITE BADGE

BILL OF FARE.

COMPLIMENTARY BANQUET

TO THE

Master Car Builders of the United States,

AT THE

ST. NICHOLAS HOTEL,

ON

Thursday Evening, June 9th, 1870,

GIVEN BY

Messrs. L. G. TILLOTSON & CO.,
Messrs. VOSE, DINSMORE & CO.,
UNION CAR WHEEL WORKS,
Messrs. HUSSEY, WELLS & CO.,
NEW-YORK STEAM-ENGINE WORKS,
RAMAPO CAR AND WHEEL WORKS,
UNION CAR-SPRING CO
HAMILTON RUBBER WORKS,
NEW-JERSEY CAR SPRING COMPANY,
Messrs. RICHARDSON, MERRIAM & CO.,
Mr. JOHN ASHCROFT,
Mr. WM. TOOTH,
Messrs. W. B. RICHARDS, Jr. & CO., Messrs. LINDSAY, WALTON & CO.,
Messrs. W. G. CREAMER & SON,
Mr. A. BRIDGES,
Mr. S. A. WOODS,
NEW-ENGLAND CAR-SPRING CO.,
Messrs. J. R. THOMPSON & CO.,
MANHATTAN OIL CO.,
Messrs. NATHAN & DRYFUS,
Messrs. WALTER GREGORY & CO.,
Messrs. S. T. BAKER & CO.
STAR RUBBER CO.,
Mr. M. B. WASHBURN,
Col. E. MILLER,
Mr. S. B. UNDERHILL.

S. W. Green, Printer, 16 and 18 Jacob Street, New-York.

least, not anything which can in any way be compared with what we consider an exhibit to-day.

The front cover of the program was decorated with a steel engraving and an old gold ribbon, with the words, "Master Car Builders' Convention, Saratoga, 1884," occupied the space in the center of the cover. The dinner card, a small cardboard folder, was decorated with a steel engraving, showing a 4—4—0 type of locomotive, with a high diamond stack and long-nosed pilot. The long coupling link, very different

Reception Committee:

F. W. Devoe & Co.
Geo. R. Meneely & Co.
Clarence Brooks & Co.
Geo. Buntin & Co.
N. & A. Middleton & Co. (Limited.)
Ramapo Wheel & Foundry Co.
Geo. H. Thacher & Co.
Paige Car Wheel Co.
National Tube Works Co.
Detroit Steel & Spring Co.
Manning, Maxwell & Moore.
Nathan Manufacturing Co.

H. A. Rogers.
Otis Iron & Steel Co.
Valentine & Co.
Aaron French & Co.
French Spiral Spring Co.
Andrews & Clooney.
Griffin Car Wheel Co.
Thomas Prosser & Sons.
L. G. Tillotson & Co.
Murphy & Company.
Berry Bros.
Allen Paper Car Wheel Co.

Galena Oil Works.
Cliff & Righter Co. (Limited.)
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National Car Builder.
Troy Malleable Iron Co.
Gardner & Co.
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Pintsch Lighting Co.
J. L. Howard & Co.
Post & Co.
Rochester Car Wheel Co.

Shipman & Bolen.
C. T. Raynolds & Co.
Hale & Kilburn M'f'g Co.
Jersey City Wheel F'dry & Machine Works.
H. P. Nail Company.
R. Dudgeon.
Hicks & Smith.
Winslow Car Roofing Co.

from the present day M. C. B. pilot couplers, was also used.

On June 9, 1870, the Master Car Builders of the United States met at the St. Nicholas Hotel, New York, which was located on Broadway between Broome and Spring streets. In glancing over the list of companies giving this banquet, many names which are still familiar in railway and supply circles, are found. We have been able to reproduce these cover pages through the courtesy of Edwin H. Baker, President of

Executive Committee:

J. SEAVER PAGE. H. A. ROGERS. W. P. SEGUINE.
J. WEYMER. T. W. GETMAN. C. D'W. GIBSON.
W. W. SNOW. J. T. LEIGHTON. D. M. BRADY.

Invitation Committee:

W. W. SNOW. C. J. POST. FRANK CUMMINGS.
WM. TOOTHE. GEO. BUNTIN. C. D'W. GIBSON.
GEO. W. MORRIS. W. P. SEGUINE. F. H. ANDREWS.
R. M. VAN ARSDALE. JOS. K. BOLES. JAS. T. LEIGHTON.

Music Committee:

DANIEL M. BRADY. W. K. JEWETT. JAMES C. KELLAR.
WILLIAM M. BALDWIN. FRED. P. BARNES.

Excursion Committee:

J. SEAVER PAGE. H. S. HALE. H. A. ROGERS.
AARON FRENCH. C. F. CHOATE H. C. VALENTINE.
J. E. FRENCH. C. A. MOORE. A. A. DAME.
F. L. HOWARD. E. CLIFF. CHARLES MILLER.
FRANK MURPHY WM. J WATSON. WM. K. CHAPIN.
AQUILA RICH. R. DUDGEON. CHARLES E. TRIPP

Carriage Committee:

T. W. GETMAN. W. R. ELLIS. A. D. KEYES.
JOHN KENT. J. WEYMER. B. R. MILLER.
W. K. CHASE. J. G. HENDRICKSON. C. M. BOLEN.
THOMAS SMITH. THOMAS GRIFFIN. GEO. W. SWETT, JR.

the S. T. Baker Oil Company, whose father was a member of the firm of Messrs. S. T. Baker & Company, which name appears among the list of the companies giving the banquet. The S. T. Baker Oil Company is the present name of the firm, and it is now owned by the Galena Signal Oil Company.

Mr. Brady tells a good story on himself in connection with the St. Nicholas Hotel. His home was but a few squares from the hotel and once a month he was taken over there for a good bath, there being no such conveniences in his home. We do not mean to intimate that the boy Dan did not get but one bath a month. The others were but preliminary to the once-a-month celebration. It occurs to us that the famous "Brady's Baths" on the Boardwalk must have been instituted by our Mr. Brady as a fitting memorial to those which he used to enjoy at the St. Nicholas.

THE BALL GAME.

The annual baseball game between the railway and supply men was played at the Inlet Grounds, Saturday afternoon, and it was a "hummer."

The teams, led by the "Philopena" band and the Dear Girls in pink dresses and variegated hair, presented a pretty sight as they marched across the field.

The baseball girls were led by Mrs. Burnett. Their names follow: Mrs. Flory, Mrs. Telford, Mrs. Phillips, Mrs. Brazier, Mrs. Midgley, Mrs. Morrison, Mrs. Johnson, Miss Mabel Garstang, Miss Virginia Garstang, Miss Fowler, Miss Walsh, Miss Ramsdell, Miss Moran, Miss Montgomery, Miss Brannon, Miss Hayes, Miss Storrs, Miss Ethel McIntosh.

The following is the record of the game by innings:

FIRST INNING.

La Mar walked; stole second and third. Goodnow out at first on Martin's assist, La Mar scoring. Wildin fanned; Chandler wild as a March hare. McKedy out on strikes. Hildreth led off with a Texas leaguer; stole second. Humes fanned. Murray struck out. Midgely fanned.

SECOND INNING.

Oviatt hit a nice one over second base, went to second on a balk and stole third. Clancy hit a single, scoring Oviatt; stole second, and went to third on a passed ball. Passmore struck out. Dodds struck out. Hinckley went to first on an error of first baseman; went to second on a balk and home on La Mar's swat to left field. Goodnow out; Midgely to Hildreth, leaving La Mar on third. Martin bunted and beat it to first, but was put out, Oviatt to Passmore, trying to steal second. Johnson struck out. Nellis out, Dodds to Wildin. Wildin hit safely. McKedy bunted and took first. Oviatt hit for two bases, scoring Wildin and advancing McKedy to third, Oviatt overlooking the fact that McKedy was on third; Allen threw the ball a mile, allowing McKedy to score. Oviatt went to third on a balk, scoring a little later on a wild pitch.

THIRD INNING.

Singles each by Wildin, McKedy, and a double by Oviatt, coupled with Midgely's error netted the Railroaders four runs. Chandler hit one to Dodds and was safe at first, but Allen, Hildreth and Humes were not able to advance him. Clancy took first on an error of Midgely, and advanced to second on a wild pitch; Clancy was caught off third base, but finally scored on a poor throw. Passmore sacrificed. Dodds hit to Hildreth and was out at first. Hinckley hit to Martin, who fumbled; went to second on a balk. La Mar struck wind. Chandler got to first, on an error of Martin. Allen sacrificed, advancing Chandler to third. Hildreth out, hit by batted ball. Humes was called out on strikes; Chandler dying on third.

FOURTH INNING.

Goodnow hit one through Murray and Johnson, went to second; attempted to steal third and was put out, Allan to Martin and Martin to Midgely. Wildin out, Midgely to Hildreth. McKedy bunted to Martin and was safe. Oviatt hit to Murray, who threw to the plate to catch McKedy (Umpire called McKedy "safe"); Oviatt took second on the play and stole third. Clancy struck out, leaving Oviatt on third. Murray hit safely and got on first, stole second and went to third on an error of third baseman when Passmore fumbled the ball. Midgely made his usual home run, bringing in Murray. Martin hit by pitcher, went to first, stole second and third. Oviatt threw to Dodd and the ball went by, allowing

Martin to score. Johnson was presented with first base by Hinckley, stole second and third and was caught out at home. Nellis out at first. Chandler made a three-bagger off his competitor. Allen, out at first, retiring the side.

FIFTH INNING.

Passmore hit safely. Dodds struck out. Hinckley hit to Short, forcing Passmore at second base; advanced to second on a passed ball. La Mar hit safe to first, scoring Hinckley. La Mar was put out in an effort to take second on the play. Hildreth out at first, Passmore to Wildin. Humes received, on his shoulder, the ambition of Hinckley, getting first as remuneration, and stole second. Murray struck out. Midgely drove a hot one to Passmore who, in his vigor, handled it very nicely.

SIXTH INNING.

(Note—Hildreth retired; Hibbard went to Short, Murray to second and Midgely to first). Hibbard on third. Goodnow struck out. Wildin made a fine hit to middle field, safe for three bases, but was caught out at the plate in an effort to stretch it into a "homer." McKedy went to first, Allen missing the third strike; stole second and went to third on an overthrow. Oviatt was out at first, retiring the side. Martin out at first on Passmore's assist. Johnson struck out. Fred Nellis hit a slow one to La Mar, but applied the emergency brake too soon and was out at first.

SEVENTH INNING.

(Sharp substituted for Dodds). Clancy hit to Martin, "Splinters" making a nice catch of Clancy's "fly" one. Passmore out on a fowl which was gobbled by Midgely. Sharp (substituted for Dodds) hit safely and advanced to second on error of Hibbard. Sharp went home on a passed ball. Hinckley made first, to his great joy. La Mar out at first. on Martin's assist to Midgely, retiring the side. Chandler hit safely. Allen out on a fly to Wildin. Hibbard hit for two bases, scoring Chandler, went to third on Midgley's two-bagger. (Did he score?) Midgely hit a two-bagger, stole third. Murray hit to first and advanced to second on a passed ball. Humes went to first on a passed ball, Murray and Midgely coming home. Martin hit safe and advanced to third on the play, bringing in Humes, and came home on Nellis' hit. Johnson went to first, hit by misguided efforts of Hinckley. Nellis hit safely to left field, bringing Martin home and advancing Johnson to second; Johnson and Nellis each advanced a base on a passed ball. Chandler and Allen ended the agony by striking out, leaving Honson and Nellis on the sacks.

EIGHTH INNING.

Goodnow walked to first, stole second and third, and scored on Wildin's Texas leaguer. McKedy hit to Martin, who threw wildly to first, allowing Wildin to score; McKedy taking third on the play. Oviatt sacrificed, out at first on Hibbard's assist; Oviatt scoring. Clancy struck out. Passmore struck out, retiring the side. (Rasbridge took Clancy's place, Passmore going behind the bat and Oviatt going to second). Hibbard hit to La Mar, who made a neat running catch, reminding his friends that Ad knows how to make things stick. Humes struck out. Murray out; Sharp's assist to Wildin.

NOTES.

Fair and impartial decisions of Umpire Brady and the spirit in which they were accepted:

"Noble Supplymen—Their's not to reason why;
Their's but to do or die;
Was there a man dismayed? Only Allen."

Railway team composed largely of the mechanical department of the New Haven road, whose organization is composed almost entirely of Yale students.

The members of the winning team were each presented with a handsome silk umbrella.

Diamond Jim's umpiring gave general satisfaction.

It is the consensus of opinion that the teams should be made up representing the East and West of an equal number of railway and supply men on each team. That would bring about the old-time rivalry and make the game more interesting.

SIDE BEARINGS AND CENTER PLATES FOR FREIGHT AND PASSENGER CARS.*

The committee communicated with George L. Fowler, Consulting Mechanical Engineer, and Prof. E. C. Schmidt, of the University of Illinois, asking for reports as to the cost of conducting tests of center plates and side bearings. From these reports the committee decided it would cost at least $4,000. It was therefore suggested that the committee take the matter up with railways owning dynamometer cars, to see if arrangements could be made with some road for conducting practical service tests. The committee requested the Superintendent of Motive Power of five roads owning dynamometer cars to make tests to determine:

1. The resistance to turning of different types of center plates.
2. The effect of lubricating center plates.
3. The resistance to turning of different types of side bearings.
4. The effect of varying the clearance of side bearings with a view to determining the best clearance.
5. The effect of varying the spread of side bearings with a view to determining the best spread.

These tests were to be made on stretches of level track about three miles long, consisting of two tangents with a curve of from 8 deg. to 12 deg., 500 ft. to 600 ft. long between them. By means of a dynamometer car the pull of a train of five or six 80,000 or 100,000 lbs. capacity cars was to be measured under various conditions, the cars being loaded with material of such nature as car wheels which would allow of varying the distribution of the load.

All of the roads replied that owing to the depression in business and the fact that forces had been greatly reduced, they did not care to undertake the tests at this time.

The committee again recommends that an appropriation sufficient to have tests made at some engineering university be considered at some future time when business conditions warrant.

Loading Material.†

The committee has no recommendations for changes in the present rules to present at this convention. During the past year, particularly toward the latter part, some subjects have been presented. They have been duly considered, but in the opinion of the committee they involve phases to which more time should be given before they will be able to make definite recommendations.

CONVENTION BADGES.

TO THE EDITOR OF THE DAILY RAILROAD AGE GAZETTE:

At a meeting of our Exec tive Committee motion was made and carried that the *Daily Railroad Age Gazette* be requested to publish a notice that it is the sense of the Executive Committee that every railway supply man should purchase and wear a supply man's convention badge, whether or not he is entitled to a railway badge on account of his membership in the Master Mechanics' Association or the Master Car Builders' Association.

E. G. F. SMITH,
Secretary Railway Supply Manufacturers Association.

Robert P. Lamont, first vice-president of the American Steel Foundries, Chicago, paid a short visit to Atlantic City and the conventions last week. This is Mr. Lamont's first visit to these gatherings since 1907. He did not take his departure before greeting many old time friends, both among the railway officers and the supply men.

*Abstract of a report presented at the annual convention of the Master Car Builders' Association. Committee: R. D. Smith (chairman), R. P. C. Sanderson, J. H. Manning, J. F. Walsh, G. C. Bishop, F. F. Gaines, C. A. Schroyer.

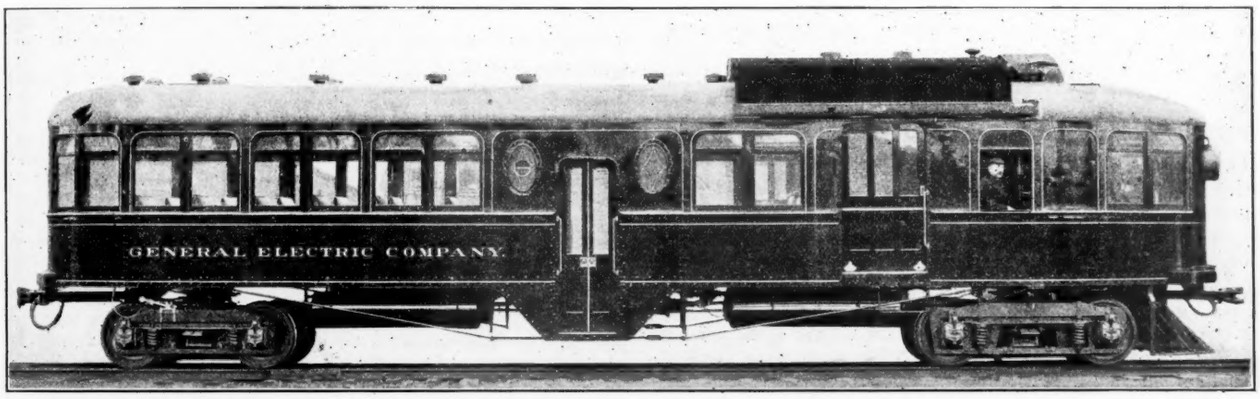
†Report presented at the annual convention of the Master Car Builders' Association. Committee: A. Kearney (chairman), C. E. Fuller, A. Stewart, William Moir, J. S. Lentz, W. F. Keisel, L. H. Turner.

G. E. GAS-ELECTRIC CAR.

While the General Electric Co., Schenectady, N. Y., maintains a reception booth on the first floor of the second building on the Pier, the company's exhibit is to be found on the exhibition sidetracks, Mississippi avenue, one thousand feet south of the Pier, in the shape of a powerful gas-electric car designed for short line service.

This car is about forty feet long, the ends parabolic in shape to reduce the air resistance to a minimum when traveling at high speed. It will seat about fifty passengers in comfort besides carrying their baggage and a reasonable amount of express and mail. The car came from the company's plant at Schenectady, under its own power and is expected to return the same way. During the convention week, a number of special trips will be arranged to take parties out for short rides of twenty or thirty miles along the Philadelphia & Reading lines.

The forward truck is equipped with two standard railway motors of 100 h.p. each, and in the forward compartment of the car is the power plant, consisting of a gasolene engine and an electric generator of about 125 h.p. capacity. There is no mechanical connection between the power generating plant and the power truck, the power being transmitted by electricity and controlled by a device similar to the controller on a trolley car, whereby the car may be started, accelerated, stopped and reversed by the operation of controller handles, giving a great flexibility of control and ease of operation, this control being very simple and economical, and in effect being equivalent to a mechanical connection with a practically infinite number of gear ratios, but without change gears.



Gas-Electric Car No. 3.

The speed of the car will be from 50 to 60 miles per hour, and the car can be started, stopped and reversed without stopping or changing the direction of rotation of the gas engine.

Couplers are provided at each end of the car which will automatically couple with standard M. C. B. couplers.

The forward motor truck has a wheel base of 6 ft. 6 in. and is equipped with standard M. C. B. 33-in. wheels, boxes and axles, equalized and equipped with swing bolster, weight 9,500 lbs. The rear truck is substantially the same as the motor trucks, but with 5-ft. 6-in. wheel base and of somewhat lighter construction, weight 6,750 lbs.

The motor truck is equipped with two standard type G.E. 600-volt, box-frame, oil lubricated, commutating pole, railway motors; each motor is of 100 h.p. on bases of standard rating. Motors are mounted directly upon the axles with nose suspension and equipped with standard gear cases.

The power plant consisting of an 8-cylinder, 125 h.p., 550 r.p.m., 4-cycle, gasolene engine of the V type direct connected to an 8-pole, 80-kw., 600-volt, commutating pole generator and direct coupled 3½-kw., 32-volt exciter.

The base is of cast iron and is provided with suitable handholes for the inspection of main bearings and big ends. The crank case is constructed of cast iron, suitably ribbed and bolted direct to the base. The cylinders are 8 in. x 8 in. and are constructed of soft, close grained, gray cast iron. Water jackets are cast integral with the cylinders. Exhaust and inlet valves are on the same side. Pistons are of the trunk type and made of the same material as the cylinders, fitted with three cast-iron snap rings. Connecting rods are drop forged machinery steel. Piston pins are of steel, hardened and ground, fixed in end of connecting rod with two bearings in piston. Bearings throughout consist of bronze cages, lined with babbitt. Crank shaft is of high carbon machinery steel, forged in slab and machined to size. Flange couplings for cam shaft gear and generator are forged integral. Cam shaft is made of machinery steel upon which the cams are cut from the solid stock. Cam shaft gears are of bronze and machinery steel. All valves are of nickel steel. Lubrication is secured by automatic force feed oiler, supplying oil to all wearing surfaces. Engine cooling is by thermo-siphon circulation in radiators of fine tube type of 2,000 sq. ft. cooling surface and 60 gallons capacity, suitably placed on the roof of the car. The cooling system is arranged so that it may be filled from the exterior of the car. All parts of cooler and engine can be readily drained.

Ignition system consists of high tension magneto and plugs. Carburetor is of overflow type, with adjustable control for warm air supply. Gasolene is supplied to the carburetor by means of a plunger pump mechanically driven from the engine. An auxiliary hand pump is also provided for starting.

The generator and exciter are built in accordance with the General Electric Co.'s standard practice, but specially designed to meet the conditions of this service. Rating of generator TD-8 poles, 80-kw., 550 r.p.m., 600 volts. Rating of exciter MP-6 poles, 3½-kw., 550 r.p.m., 32 volts. The magnet frame is bolted directly to the end of the engine frame by a suitable flange. Commutating poles are provided. The outboard bearing is ring oiled and contained in a three-arm bracket bolted to the magnet frame. The armature and commutator are of large diameter, the commutator overhanging the exciter, resulting in a compact design with both commutators on the front of the generator and easily accessible.

An air pump driven from the main crank shaft of the engine supplies air for the brakes and whistle. This pump cylinder is 4 in. x 4 in., and has a displacement of 16 cu. ft. of free air per minute when running at 550 r.p.m. (the normal speed of engine).

The gasolene tank is of steel and of 90 gallons capacity. This tank is under the car body and a convenient means is provided for filling it from exterior of car. Two strainers are supplied between gasolene inlet and engine. Only one pipe leads from this tank to the gasolene pump; it leaves the tank at the top.

A special controller is provided by means of which the motors are placed progressively in series and parallel and the voltage applied to them controlled by varying the strength of the generator field. The controller is provided with a reversing handle to change polarity of the armature current in relation to the field current of the motors, and thus reverse the car. Substantial handles for spark and throttle are conveniently placed on the controller.

Special control can be provided, arranged for operation from either the self-contained power plant or from the 600-volt direct current overhead trolley circuit of a street railway system. When operating from the self-contained power plant, the speed of the motors is governed as described above. When operating from the overhead trolley, the motors will be controlled in the usual manner: i.e., series-parallel connecting with intermediate steps obtained by placing resistance in the main circuit. The same handle accomplishes both operations.

Combined straight and automatic air brakes are provided, the straight air being for use when the car is operated alone and the automatic air for use when hauling a trailer furnished with standard automatic brake equipment. The compressed air supply is provided by the 4 in. x 4 in. single cylinder, single-acting pump, direct driven from the main crank shaft of the gasolene engine, already described.

Three main reservoirs are provided, each being 18 in. x 57½ in. There is also an auxiliary reservoir 12 in. x 33 in. The brake cylinder is 10 in. in diameter. An engineer's brake valve is furnished for each air brake system, and a conductor's valve is provided in the passenger compartment.

An auxiliary ratchet hand brake is provided in the engine compartment.

The gasolene engine is started by compressed air from the main reservoir through a distributing valve to the several cylinders in succession. For recharging the reservoirs, if necessary, when the main engine is shut down, a 3¼ in. x 4 in. single cylinder, single acting air pump, direct connected for journal box wedges, substituting therefor "drop forged." to a 4-h.p. single cylinder, 2-cycle gasolene engine located on the left side of the engine compartment. This auxiliary air pump equipment is complete and includes carburetor, ignition outfit, cut-out cocks, valves, etc.

The car is electrically lighted by 25-volt incandescent lamps. Current is supplied from the exciter when the main engine is running and from a 12-cell storage battery, located under the car body, when the main engine is shut down. Automatic means are provided for switching the lights from one circuit to the other and also for charging the battery from the exciter. There is a 32-c.p. incandescent headlight.

The car body is heated by a system of hot water circulation on the thermo-siphon principle, the heat being obtained from the exhaust gases.

An air whistle and gong is provided. There is also a suitable signal starting bell, with bell cord extending through the car.

A standard fire protection plate is suitably mounted in the car body.

ATLANTIC CITY EXHIBITS.

P. E. Lane, contractor for the booth on the Million Dollar Pier, has planned to built a structure near the Boardwalk, in which exhibits now here may be kept at Atlantic City for show during the months of July, August and September. The building will be made attractive inside and out. The general effect will be much like that of Entrance Hall, as it has appeared during this convention. Several exhibitors have already contracted for space. Arrangements for keeping the exhibit in storage at Atlantic City for a longer period may be made with the Eldredge Express Company. Mr. Lane's address is care of the Million Dollar Pier.

MASTER CAR BUILDERS' ASSOCIATION.

Proceedings of the Second Session of the Forty-third Annual Convention.

President McKenna called the meeting to order at 9 o'clock.

The secretary announced that M. E. Endsley, Associate Professor of Railway Mechanical Engineering at Purdue University had been proposed for associate membership in the association. In accordance with the provisions of the constitution, this proposal will lie over until the next annual meeting.

The first report was that of the standing committee on Coupler and Draft Equipment. Mr. Stark presented the report.

Discussion on Coupler and Draft Equipment.

Mr. Stark—I might add that we have the gages here for gaging the coupler shack butts and also the test of the coupler face, which can be examined by anyone interested. We are greatly indebted to the Pennsylvania Railroad for the manner in which they accorded the committee the facilities for making these tests. They provided a train of 14 cars loaded to the maximum capacity, with the dynamometer car used for recording the drawbar pull and a special head for the recording of side clearance. This special train has been operated over various divisions of the Pennsylvania with a corps of experts to carefully make a record. A number of these gentlemen are here and are ready to answer any questions that may arise.

R. P. C. Sanderson (Virginian)—I understand fully the reason for recommending this new test for the face of the couplers, and it is good, but the guard-arm test always seemed to me to be a particularly good one for getting at the real quality of the material used in the coupler. I would like to ask those who made the face test whether, in their judgment, the face test is as good an indication of the quality of material, separate and distinct from any question of design, as the old guard arm test was.

I would like to ask further whether the committee considered the advisability of increasing the pulling test. I do not believe, personally, that the present limits of 150,000 lbs. are anything like sufficient.

I think the drop tests, as they stand to-day, the amount of the weight and the height, is ample for all testing purposes by impact, but I do believe we should increase the pulling test limit. In getting couplers built for our very heavy service I went into the matter with the coupler manufacturers and had couplers made and tested. In some cases we got 320,000 lbs. pulling test before we reached the limits of opening of the test requirements of the M. C. B. specifications, ⅜ of an inch, I think it is, showing that with the present contour lines and limits it is possible to go beyond the testing limits. We want the best couplers we can get. We do not want broken trains, and if by raising the pulling test limit we can better the quality of the coupler, I think it would be an excellent thing to do.

The tests mentioned in the report for side coupler clearance and the resulting rail pressures, etc., were very interesting to me. I have done a good deal of work in a rough way myself on that line, and I am disappointed that the committee did not find that the pressures were worse. I thought they would show up much worse. There is one thing not mentioned in the report here, and I would like to ask if anything was learned about it in connection with the work of the tests. The test train referred to here consisted of cars of uniform design. In going around curves the offset of the coupler of each car was uniform with the offset of the coupler of the adjacent car. In making up trains in the general interchange of business we get 40-ft. cars coupled next to 60-ft. cars and cars of other dimensions, and the offset of the coupler from the center line of the track will vary from 2 to 3 in. in one case as compared with the other. This will throw considerable lateral strains on the coupler shanks, the rails and the wheel flanges, over and above what it would be if the cars were of uniform length and the distance from the center line of the track to the coupler were the same. I made some rough tests some years ago and found the pressures very severe. I would like to know something about this from the Pennsylvania people, if they can tell us.

R. L. Kleine (Pennsylvania)—In regard to the face test being a suitable substitute for the former guard arm test, in addition to the test for which it was designed, I would say that we measure the deflections between the point of knuckle and the guard arm on these face tests as well as the bending in the shank, which will show any very soft metal in the couplers.

In so far as increasing the pulling test is concerned, you all know that the pulling test was increased last year to 150,000

lbs. Some couplers which have been tested in the pulling test, as stated by Mr. Sanderson, that run up to 300,000 and 320,000 lbs., do not necessarily stand up very well under some of the other tests, such as the striking test and the former guard-arm test. I do not believe we should make any change in the pulling test at this time.

In regard to the different lengths of overhanging of cars and their influence on side coupler pressure, it was necessary to take cars of one length, in order to keep out so many variables, and work from that standpoint. Really, the tests that were made were made on as high as a 22-degree curve, and showed that really the side pressure was the resultant of the drawbar pull and the side pressure registered on the dynanometer. Therefore, the different lengths of overhang of cars would not cut very much of a figure on what we may term regular road curves. They do make a decided difference when we get into short curves in industrial sidings, and even on crossovers that are commonly used. The different lengths of overhang do not exert a side pressure on the end sills of the cars sufficiently to be detrimental.

A. W. Gibbs (Penna.).—Perhaps Mr. Kleine would add a statement about the great amount of divergence in displacement that was found—somewhere between 20 and 30 on some of these industrial sidings, showing how difficult it is to meet all those conditions. You get to a point where you have wheel interference with your sills, so that you are really restricted within some limits.

Mr. Kleine—On a 62-foot reverse curve without tangent between, we made a test on cars which were 44 ft. 11 in. long, with the face to face coupler, and we found that the couplers had a side displacement of as much as 39 in. But of course that is rather an impracticable condition for the cars to go around. The wheels at the same time interfered with the center sills. We had an auxiliary coupler when we made that test, and the cars were loaded. We got pretty well on to the center of the curve when the auxiliary coupler broke; we measured the displacement of the two cars, and it was 39 in.

F. W. Brazier (New York Central)—There is one point that has not been brought out here at all. Even the Coupler Committee has not mentioned it. I have here a communication that the American Railway Association sent to our secretary, in which is quoted the following resolution:

"Resolved, that the Master Car Builders' Association be requested to undertake to design a standard freight car coupler, and to consider the necessary details in connection therewith, its recommendations to be reported to this association."

That has been referred to the Coupler Committee. I think that some day we will get down to one standard M. C. B. coupler. It is all nonsense for this committee to keep on every year recommending to you improvements, and then purchasing agents and others buying couplers by the pound and paying no regard whatever to the recommendations of the M. C. B. Association.

I would like to read some data on this subject:

"A recent inventory of the second-hand coupler bodies in stock waiting repair parts, taken on a road having a representative membership in the Master Car Builders' Association of 72,000 cars, showed a stock of 2,015 coupler bodies. This was divided between 25 different makes of couplers and represented in the credit allowed car owners therefor at 75 per cent. of new value, the sum of $11,707. To be conservative, we might eliminate 719 coupler bodies, representing a value of $3,737, which covers four types of couplers that could be classed as standards for that road. This leaves 1,296 coupler bodies, valued at $7,969, that are being held for some repair parts to make the coupler complete.

"On a car representative basis this means $0.11 per car for that road, and with a representation in the Master Car Builders' Association of 2,292,799 cars this would mean a money value, assuming all roads in the association met with similar conditions (and this is a fair assumption) of $252,207.

"This same road at present carries a stock of coupler material valued at $27,744, of types standard to its cars, which is $0.38 per car. Its stock of coupler material, types standard to its equipment, foreign incomplete couplers, and foreign coupler repair parts included, is valued at $43,122, or $0.60 per car. On the total representation in the association, this would mean that these roads are carrying coupler material valued at $1,375,679; whereas they could, with a standard coupler, reduce this to $871,263. This would effect a saving of $504,415, or 37 per cent."

I think it is about time we took a decided stand and had one coupler, or if we could have a knuckle that would be interchangeable it would stop delays and a whole lot of other things. We have 4¼ and 5x9 journals, and size of wheels, and I don't see how it is going to stop competition any more than it does in journal bearings, oil boxes and everything else that is interchangeable. Furthermore, the sooner we stop using overhead coupler arrangements the better off we will be. Some side or bottom coupling arrangement will be the best from the repairer's standpoint.

G. W. Butts (Penna.) was given the privilege of the floor in order to explain the gages. Mr. Butts: I think the principal trouble with the attachment of coupler yokes to the butts has been the failure to secure a proper fitting of this lug here. A great many couplers found in repair yards, and, in fact, new couplers, show that the lip of the yoke stands away from the lug on the coupler butt, which places all of the strain upon the rivets, and either results in their shearing or partially shearing, until the yoke moves up that amount. By using a gage similar to this one it compels the butt to be of such dimensions that the distance between the centers of the rivet hole and the edge of this lug is within 1-32 in. of the drawing size It would hardly be reasonable to make it absolutely exact. This gage has 1-14-in. tubes and the distance from the center of the tube to the edge is the same as those distances on the yoke. Therefore the only variation allowed is the difference between the 1 5-16-in. holes in the coupler butt and the 1 1-4-in. tubes. This, then, insures the proper spacing of the rivet holes to the edge of this lug, and it also insures the top and the bottom of the butt being square, inasmuch as the tubes pass all the way through. The gage should be applied this way (illustrating) and then the coupler or the gage turned around and applied to the other side. There is a small gage similar to this shown in the report for gaging the lips on the yokes.

F. F. Gaines (Cent. of Ga.)—I do not see that the committee has said anything about the question of having holes in the butt a split wall bore. I know I brought that question up before, but I have been experimenting along that line for some little time. We had trouble with loose coupler yokes, and while I do not question that the lip properly applied is going to keep them tight, the average employee we have applying coupler yokes is going to make a quick job. There are a number of roads I know of that are using three rivet holes to overcome the trouble. Some others have gone to making a solid wall all through the rivet butt, and the rivets are squeezed in and bent up. You can put in the rivet under hydraulic pressure or pneumatic pressure and get a solid job, and while the committee has not made any mention of it, it seems to me that is a point that will overcome a good deal of the difficulty in attaching couplers.

Eugene Chamberlain (N. Y. C.)—I ask the gentlemen from the Pennsylvania whether turning out the lug, placed upon the drawbar, which he indicated, had a tendency to relieve the strain upon the rivets without adding to the strength? I wanted to ask a very simple question suggested by Mr. Gaines; that is, if anyone has attempted, after the introduction of the rivets, to determine the strain that is necessary to strain out these lugs or lips; in other words, how much of the strain does that take from the rivets?

William McIntosh (Cent. of N. J.)—From observation I should say that it would take very little of the strain. As a rule, they do not come in contact with the coupler lug on the start, and usually get further apart in their career. I also want to tell you one thing not to do, because I tried it and know it does not work; that is, in my efforts to have the rivet holes solid, to fill the holes, we decided we would heat both ends of the rivets, and in setting them up with a hydraulic machine we were sure that we filled the holes completely. The result was that in a very short time we found that about twice as many rivets were broken as before, notwithstanding the fact we had the holes thoroughly filled up, and well lined up, too, as far as that is concerned. It seems that the contraction was so great on the rivets in heating them in that manner that they pulled apart.

Mr. Kleine—Last year I believe the Coupler Committee touched on the yoke and rivet question very much in detail. As a matter of fact, the committee was very much surprised when they had some of the work done at the shop to see what an absolutely poor fit and poor method of applying the rivets was being practiced. We had some butts cut apart, both from cars in service and from newly riveted yokes to coupler butts, and the pictures, I believe, were in last year's report. The gages presented here will unquestionably relieve that situation a good deal. If the coupler with the lips fits the butt properly and the rivets are properly applied, I believe we will be relatively free from shearing of rivets. Just how much strain these lips will take off the rivets we will not determine by test, but it is a simple matter to do it, and I have no doubt whatever that if the fitting is properly done, which has not been done heretofore, the trouble from the shearing of the rivets will be practically eliminated.

W. E. Fowler (Can. Pac.)—I want to endorse what the gentleman has just said, not from the standpoint of tests, but from the service standpoint. I have proven not only to my own satisfaction, but to the entire satisfaction of all of my staff, that a properly fitted yoke when the coupler and yoke

are first assembled, will go right through years of service without any failure, and I have proven that time after time by asking my friends who question the statement to go through the scrap pile. I do not think there is any better demonstration than to see how many couplers and yokes are in the scrap pile.

I have been such a strong believer in the proper fitting of the yoke and coupler that in going through the blacksmith shop, where, perhaps, we fit more couplers than most roads, I make it a practice to see what kind of a fit we get with the lip or yoke up against the shoulder of the butt, and since I have made it a practice of being extremely particular about that—in fact, I have gone to the extent of ordering a coupler sent back from the erecting shop to the blacksmith shop, if any were found not properly fitted—I want to tell you we have eliminated in the last five years, I should say, 60 per cent. of the yoke failures. I do not know whether that is exceptional or not, but it is the sum of the experience we have had on the Canadian Pacific.

Mr. Schroyer—I think if you will put one of these drawbars, with the pocket attachments having a lug, in a testing machine, and one without the lug in a testing machine, you will find that the one without the lugs has a strength equal to the shearing strength of the rivets. If you will put the other one in the testing machine and test it out, you will find it will have a strength equal to the shearing strength of the rivets, plus the straightening strain necessary on the pocket. That would be an additional strength, and that strength would be amplified in proportion to the distance between the shoulder of the lug and the rivet. If the rivet could be passed down through the lug itself, you would find that the increased strength would be amazing, and it would be equal to the shearing strength of the iron, which, in the case of the standard pocket, I should say, would be anywhere from 100,000 to 150,000 lbs. in that particular point.

I think if Mr. McIntosh will look into the trouble he has had he will find that it is due to the fact that the heating on the rivet is too long, and the shrinkage of the rivet when cool is so great that there is an internal strain and the breakage is due to that internal strain. When we mount pockets on couplers we do not heat the rivet back through the head. We do not depend on the shrinkage of the rivet for drawing the pocket tight to the drawbar. We press it tight and then put in the rivet. For a great many years we used a drawbar stem with a double bracket, one in front of the lug and the other in back, the one in front to keep it moving one way, and the one in back to keep it moving the other way, and when these drawbars were mounted with the pockets the ends of the pockets were heated, and under the hammer they were driven down until they entirely filled the space between the lugs and where these were put on (we used only one rivet in those days), and it was one of the rarest things for the pocket to break at that point. The pocket failures were always at the back ends. We used a tandem spring device, the front spring being operated in both directions, while the back spring was only operated in the buffing shop. As the result of the action taken by the Master Car Builders' Association we abandoned that front bracket, and now we use the pocket with the lug turned down, and if you will examine our scrap pile (and all drawbars coming in from the entire system come into one place), you will find there is not 1 per cent. of the drawbars that have failed that have done so because of the pockets getting loose. Our failures are at the back end, in the pocket just back of the stem of the coupler. Very often when a drawbar fails on the road, they will cut the rivets out and put on a new pocket, and if they are not provided with means for putting in rivets, they will put in bolts, and we do have trouble with that sometimes. I think much depends on the way the pockets are mounted.

J. R. Onderdonk (B. & O.)—On the Baltimore & Ohio we made a number of tests of the action of the coupler yoke, principally under the drop test, as we felt that that more nearly represented the service conditions than the ordinary pulling test. With a yoke with a small radius at the bend of the back, the coupler and the yoke failed at this point with a very few blows. By increasing the radius to the present standard the failures were principally due to the shearing off of the rivets. By bending the yoke over as at present it increased the number of blows necessary about 50 per cent. before final failure, especially if the lug was brought down to bear against the tail of the coupler, but even with this and good workmanship we still had the loose rivets in service. This seemed to be brought about by the tendency in curving, of causing the yoke and coupler to bend more or less at the connection, and when the rivets were found to be loose, they were not loose in a longitudinal direction, but transversely of the coupler, showing that there was considerable side strain that cause the rivets to be loose. I think possibly some form of connection between the yoke and coupler that will give some flexibility will probably give better service

F. H. Stark (Pittsburgh Coal Co.)—I believe that the statement made by Mr. Onderdonk is more or less true, and yet during the tests the committee had cars equipped with the long pocket and short pocket and the lateral pressure against the end sill of the car, where it was equipped with the long tandem spring, was not increased very appreciably. This test has rather exploded that idea of the rivets being sheared off altogether by that fact, while I presume it does have some effect, and it will also dispel the idea that the brass wear and flange wear has increased very largely on account of the side pressures. We rode on the train and stood on the end of the car going around curves from 13 to 18 degs., and the lateral play of the coupler was much less than we expected, and did not produce any lateral pressure at all.

Mr. Onderdonk—In regard to the resistance test referred to in the report, I ask whether the train was run at a uniform speed, or at simply the speed the engine happened to pull the train at. As far as the resistance is concerned, behind the dynamometer car it would be either the resistance of the train or, if the speed changed, the amount of pull that the engine might exert, depending whether the engine was operating to run at an ordinary speed or not.

Mr. Kleine—The train was run at a uniform speed. The speeds were varied on different runs. The train was run at a speed of 5 miles per hour, but the object was to keep the speed of the train uniform over the entire division. Then the test was made with a speed of 10 miles per hour, and a speed of 15 miles per hour on the third test. Then the coupler side clearances were changed and one test was made with 1 in. clearance, another test with 2 in. clearance, another with 3 in. clearance, another with 4 in. clearance and another with 5 in. side clearance.

Mr. Onderdonk—I would like to know about what the percentage of error would be in the test. I get from the diagram that the test was made on a 3.3 per cent. grade. The drawbar pull on that grade would be mostly due to gravity, and as the train only had 14 cars it would seem that the percentage due to any difference in resistance, if there is such, or due to side bearing clearances, would be very small in comparison with the total, and I ask whether the instruments were sufficiently delicate to show up any difference.

Mr. Kleine—The difference in speed was not more than 1 mile per hour. We had electrical contact between the dynamometer car and the engine, and also a speed recorder on the engine, and in that way we kept the speed fairly uniform. The grade on which most of the tests were made was a 1 per cent. grade.

The President—If there is no further discussion on this subject it will be in order to take final action on the report of the committee.

Mr. Schroyer—I move that the report be accepted, and the recommendations contained in the report be submitted to letter ballot.

Motion carried.

The report of the Committee on Revision of Rules for Loading Long Materials was taken up. Mr. Kearney, chairman of the committee, was not present and the secretary presented the report.

Discussion on Revision of Rules for Loading Long Materials.

There was no discussion, and the report was received and ordered spread upon the minutes.

The report of the Arbitration Committee was then taken up.

Discussion on Arbitration Committee Report.

The Secretary presented the following additional report of the Arbitration Committee, which was discussed paragraph by paragraph.

A meeting of the committee was held yesterday afternoon, at which a number of the representatives of different roads were present. The report of the committee was considered, and as a result certain modifications of the report have been agreed upon, as follows:

Rule 7—Your committee would recommend that an additional paragraph be added to this rule as follows:

"Brake Burn—Wheels having defective treads on account of cracks or shelling out due to heating."

H. La Rue (C., R. I. & P.)—I would like to strike out the words "brake burn." I do not think it is policy to use those words.

Mr. Schroyer—What would you use?

Mr. La Rue—Give a description of the defect.

Mr. Hennessey—The question of just how to word that was discussed possibly a half hour yesterday. It is a new term in wheel defects, and it was the sense of a large majority of the gentlemen present that it was about the best term that could be used, and not go into something that would be very misleading. The first part of the rule refers to shelled out. This describes the brake burn.

G. E. Carson (New York Central)—Wheel manufacturers claim there is no such thing as shelled out or brake burn, for

which they are responsible. I do not think the words "brake burn" should appear in our rules.

Mr. McIntosh—I agree with the last speaker that the words "brake burn" should not appear in any of our records regarding defects on the tread of a wheel. The wheel should be built to withstand the action of the brake-shoe. If it does not do that, under ordinary circumstances, it is not a good wheel. I think that the only condition that should be described in that connection is a slid flat wheel. If it is a slid flat wheel, I fancy that relieves the wheel maker, but if there are any defects that develop under ordinary breaking conditions, those are defects that should be made good by the wheel makers.

I. S. Downing (L. S. & M. S.)—If you have a wheel which fails on account of a trade hole which is a manufacturer's defect, the owner would reclaim on the bill rendered against them.

A. W. Gibbs (Pennsylvania)—It is necessary to have a distinction, and to define brake burn. On looking over some papers this morning, I find a report on the failure of wheels and find a large number of wheels recorded as shelled out. Why? Because inspectors do not know any other recognized term to describe it. They are not really "shelled out" wheels in a sense we used to describe them, the raised center with the ring around. I do not know of any term by which we can describe them better than brake burn. This table shows a large number of shelled out. They are not shelled out. They are these defects that everybody knows of as a brake burn, and we might as well recognize that officially. Our correspondence is full of matters relating to brake burn. Why not recognize that, when it is a fact?

Mr. Hennessey—Is it not a fact that the defects are caused by the wheels being heated? You set the brakes tight and keep the car moving and heat the wheel all around, and it causes these cracks. The term "brake burn" may not sound just right, but we want some distinction made in the definition which will describe that condition. It seems to me it does not make much difference whether it is heating or burning. You might use the term "brake heating." All we are trying to do is to get a definition of what causes the cracks in the wheels toward the tread, and in the tread of the wheel from heating by the brakes.

Mr. Onderdonk—We designate two forms on the B. & O. One is the shelled out, where it is the manufacturer's defect, with the raised center; when it is due to burning of the crystals of the chill, gradually dropping out, it is designated as a blotch.

Mr. Schroyer—Let us call it a blotch.

Mr. La Rue—Mr. Hennessey is correct in one statement, in regard to the pressure from the brake, but our main trouble is because of friction between the rail and the wheel; that makes the small spot that afterwards comes out.

Eugene Chamberlain (New York Central)—Are there any gentlemen present representing the manufacturers of car wheels who would be able to tell us regarding the constituents of the wheel, what composes the wheel, whether the brake burn or blotch would be intensified by the metal they put into the wheel, if the manganese, prosphorus and sulphur are in proper proportions; would this occur in the case of a wheel that is provided with a tread of sufficient density and strength to stop this blotch or brake burn?

We have gone on and increased the number of owner's defects upon freight cars until they cover everything from wheels to brake rods. If we have a few more, it will be entirely out of our hands. I should very much like to hear from some gentleman representing the wheel manufacturers—that he should be given the privilege of the floor and tell us if the wheel may be strengthened. We certainly want good wheels for our 100,000 lbs. capacity cars, and if they are going to chill that wheel and place such metal in the wheel as will cause any bad point we should take what steps we can to overcome it..

The President—The question is whether we shall accept the term "brake burn" or not.

Mr. Brazier—I move that the recommendation of the committee in regard to the definition of brake burn be adopted.

Motion carried.

The secretary then read the amendment to rule 23: "Your committee would withdraw the first recommendation under this rule, and would substitute therefor the recommendation made in the report of the committee on tank cars for the stenciling of tank cars with limit weight, as follows:

"All cars except tank cars to have their light weight and capacity or their light weight and maximum weight stenciled on them.

"All tank cars to have Limit Weight I. or Limit Weight II. stenciled on them."

The recommendation of the committee was adopted.

The secretary then read the proposed rule 33:

"Your committee approves in a general way the suggestion of the Committee on Air-Brake Hose, but would suggest, in order to make the rule clear, that it be changed to read as follows:

"Cars equipped with air-brake hose other than M. C. B. standard after September 1, 1909 (owners responsible), except cars offered in interchange where delivering company is responsible.

"Note—Cars equipped with 1¼-in. M. C. B. standard hose, and so branded, applied prior to September 1, 1909, will be accepted in interchange."

Mr. Schroyer—The question to be voted on is as to whether the hose shall be 1⅜ in. I have no objection to using it, if anything is to be gained. We know that with the larger sized hose it will cost more money and the pressure will be increased over the 1¼-in. hose with the expanded end. We have 1¼-in. pipe and fittings now, and what is the occasion for putting in 1⅜-in. hose? Why not continue with the 1¼-in. hose with the expanded end and get a uniform opening throughout?

Mr. Hennessey—As to the size of the hose, that is a question that will require more thought than we were able to give to it last night. I move that the size of the hose be referred to the Committee on Standards. The question to be decided to-day is: when will we put the rule into effect? We have been dilly-dallying with it for several years, and the committee thought by putting the rule into effect Sept. 1, 1909, we would accomplish something.

Mr. Sanderson—I think the discussion is out of order. We have adopted a certain standard hose. The specification stands and calls for 1⅜-in. hose, and this is not the time nor the place to take up the question of the modification of the M. C. B. standards.

The Chairman—The Chair decides that that is out of order.

G. W. Wildin (N. Y., N. H. & H.)—Am I to understand that the hose applied previous to September 1, 1909, though it be not stamped M. C. B., will be wrong repairs?

Mr. Hennessey—After September 1, 1909.

Mr. Wildin—We have been buying hose for some time according to M. C. B. specification, but it has not been stamped M. C. B.

Mr. Hennessey—Why do you have them stamped M. C. B.?

Mr. Wildin—We have not. I say we may now have.

Mr. Hennessey—It is not necessary.

Mr. Wildin—Is that hose to be considered wrong repairs?

Mr. Hennessey—I do not see how it would be possible for an inspector to say. How is an inspector going to tell, at interchange points, that they are not stamped?

Mr. Wildin—He could not. I should think it should be so that all hose applied after September 1, 1909, should be stamped, and let those applied before go, as long as the dates of application are on the hose.

Mr. Sanderson—That is what it does do.

Mr. Hennessey—The sense of the paragraph is that—If they are stamped they must be stamped M. C. B.

Mr. Hennessey's motion that the size of the hose be referred to the Committee on Standards was carried.

The secretary read the following in relation to rule 34:

"Owing to the recommendations made regarding rule 33, which if adopted will preclude the use of any hose other than M. C. B. standard, your committee would recommend the elimination of this rule."

The recommendation of the committee was adopted.

The secretary read the following relating to rule 41:

"To clearly define the meaning of the different cards described in the recommendations of your committee pertaining to this rule, a further modification is proposed:

"1. Routing cards—Cars bearing information required by the railroads, such as initial and number of cars, consignee, consignor, destination, contents, point of shipment, route, etc. These cards may be issued by consignor.

"3. Symbol cards (i. e., fast freight line, manifest freight, etc.) and various M. C. B. cards—Cards prescribed by individual roads for special purposes. Their size, use, text and method of application will be prescribed by each individual road to suit its requirements. These cards may only be issued by railways and may include same information as routine cards, except name of the consignor."

The Secretary—It simply means the addition of the last seven words: "These cards may be issued by consignor."

The recommendation was adopted.

The secretary read the matter relating to rule 58:

"Your committee would suggest an additional sentence in the next to the last line, as follows:

"White pine, yellow pine, fir, or cypress may be used when repairing siding on foreign cars, when of equal grade and quality to the material standard to the car."

The recommendation was adopted.

The secretary read the matter relating to rule 59:

"Your committee would approve the recommendation of the Railway Club of Pittsburg, that an additional paragraph be added to this rule, as follows:

"When necessary to renew brake beams, any metal brake beam meeting M. C. B. specifications may be used, provided that the beam applied is as strong as the beam standard to the car and does not require any change in hangers or other details."

The recommendation was adopted.

The secretary read the matter relating to rule 61:

"Your committee would suggest that the last sentence of this rule be changed to read:

"Couplers that exceed the distance of 5⅛ in. between point of knuckle and guard arm measured perpendicularly to guard arm must be repaired, in which case owners are responsible except on cars offered in interchange."

The Secretary—There is no reference to this suggestion in the report.

Mr. Hennessey—I wish to say to the convention that there is practically no change there at all. It only clears up the rule where it might be open to question. I move the adoption of the recommendation.

T. H. Goodnow (L. S. & M. S.)—You say, "except on cars offered in interchange." Doesn't that make it cardable, where they are offered in interchange?

Mr. Hennessey—Yes, repair it and charge it to the owner.

Mr. Goodnow—You want to remember that a coupler out of gage is a safety appliance defect. Therefore I consider the recommendation objectionable and that the rules should be allowed to stand as at present.

The recommendation of the committee was adopted.

The Secretary read the matter relating to rule 66:

"Your committee has conferred with the Committee on Car Wheels, and would now approve the recommendation of that committee that a new paragraph be added, as follows:

"'In no case may two new wheels having maximum thick flanges be mounted on the same axle.'"

The recommendation of the committee was adopted.

The Secretary then read the matter relating to rule 112:

"Your committee would recommend that the letters 'R and R' be added to the item reading 'Angle cock, grinding in, 28 cents,' in order to cover the total cost of removing, grinding in and replacing the angle cock."

The recommendation was adopted

The Secretary read the matter relating to rules 125, 127 and 128:

"On account of the fact that the present wording of these rules conflicts with the new Rule 14 of the code of Car Service Rules as adopted by the American Railway Association at its meeting May 19, 1909; that the routing of a car has no direct location in the M. C. B. rules. because it is a traffic matter; that changes are being made from time to time on the part of the American Railway Association or other traffic associations which necessitates changes in the rules and to avoid these changes it is suggested that any reference to the routing of cars be eliminated from the rules. To this end, your committee would suggest from Rule 125 the omission of the following paragraph:

"'If the route coincides with that over which the car passed to the point where it became unserviceable, no liability shall be incurred as between the owner and the road handling the car or for car service during this movement,' and also the entire elimination of Rules 127 and 128."

The recommendations were adopted.

The report of the Arbritation Committee as presented and amended was accepted and adopted.

The Secretary—A motion would be in order now to approve the decisions of the Arbitration Committee as far as rendered during the past year.

H. L. Rue (C., R. I. & P.)—Would it not be in order, Mr. Chairman, now that this has been passed in regard to the air-brake holes, that the notation of that should be corrected by September 1?

The Secretary—As soon as I get back to Chicago I will send out a leaflet to the members giving them a copy of the present rule as adopted to-day, so that they will know exactly what has been done.

The decisions rendered by the Arbitration Committee were approved.

The report of the Committee on Freight Car Repair Bills was then presented.

Discussion on Freight Car Repair Bills.

Mr. Crawford (Continuing): The committee made some changes due to the use of the proposed card, which I understand have been referred to the Arbitration Committee and approved. I would say these changes are merely in the wording of the present rules to permit of substituting the words "billing repair card" for "stub" and such changes as that.

The President—Gentlemen, if you will refer to page 19 of the report of the Arbitration Committee, it will be seen that this recommendation of the special committee has virtually been adopted by favorable action on the report of the Arbitration Committee, so that all that is necessary is a motion to receive this report.

The report was received.

The next report was that on Air Brake Hose. Mr. Parish presented the report.

Discussion of Air-Brake Hose.

Mr. Parish—The First recommendation has been discussed, that question of the air brake hose, the date at which the new rule will go into effect. That has been passed upon by the convention, so we will pass that. The recommendation last year referred to the question of the standard air hose coupling, standard design, and we have presented a suggested plan, giving the detail outlines, which is only a slight modification of both the New York and the Westinghouse coupling, and this will necessarily be referred to the Committee on Standards, but action will have to be taken by this convention. The only difference between this and the Westinghouse and New York is a slight difference in the gasket seat.

The President—A motion is now in order to receive the report of the committee and refer to letter ballot such part of this report as has not already been covered in the adoption of the report of the Arbitration Committee.

Mr. Parish—If I might make a suggestion, I think it would be better to refer this report to the Committee on Standards, to be brought before the convention next year. I hardly think we should vote on it by letter ballot this year.

The Secretary—Make it Recommended Practice this year.

The President—The first part of the report would necessarily have to be referred to the Committee on Standards.

The Secretary—No, not necessarily. They can dispose of it any way they want to.

C. A. Schroyer (C. & N. W.)—I want to second the motion in which it is suggested to lay it over for a year, as this matter of the coupling is something that I think we will make a mistake in getting into. We may require the builders to do it, but if they fail to do it, I do not know how we are going to check it up to find it out. We don't make them ourselves.

Mr. Parish—As chairman of the committee I believe that the committee themselves would feel that that would be the proper thing to do, although I have not discussed that feature with the committee. There are several members of the committee here and I would like to hear from them on that question. My object in doing this is that there are only very slight differences in this coupling head, but even at that it is such an important matter that I think the Committee on Standards should have it. We will be able to furnish them with large detail sheets and give them the information where the details differ.

Mr. Schroyer—Where did you get the foundation for this?

Mr. Parish—From the Westinghouse and New York companies both. There is very slight difference in them. The gasket is the main thing. The question of a standard gasket brought up this question of standard head, because it is necessary, first, to have a standard seat, which we have not got.

Mr. Sanderson—I move that the report of the committee be received and referred to the Committee on Standards for further investigation and report. (Carried.)

The President—The next report is that of the committee on Car Wheels, Mr. Garstang, chairman.

William Garstang (C., C., C. & St. L.)—Mr. President, with your permission, the committee would like to have Mr. Lockwood present this report.

B. D. Lockwood (C. C., C. & St. L.) presented the report.

Discussion on Car Wheels.

F. W. Brazier (N. Y. C.)—I move that the report of the committee be accepted, their recommendations adopted, and the thanks of this association be given to the committee for their arduous work and their clear report.

Mr. Garstang—Mr. Lockwood did not give the report of the Association of Manufacturers of Chilled Car Wheels. I do not know whether it is the pleasure of this association to have it read or not. I would like to say for the benefit of the members that there are four suggestions in the new manufacturers' report that are embodied in the M. C. B. committee's report, and these suggestions are with regard to the height of the flange, the increase of the tread, the design of the 60,000-lb. capacity wheel and the changing of the weights. Those all appear in the report of the committee among our recommendations.

The President—Gentlemen, you have heard the motion as already stated.

Mr. Brazier's motion was carried.

A. W. Gibbs (Pennsylvania)—I would like to ask the committee just what they had in view in paragraph 8, page

17: "All wheels must be numbered consecutively in accordance with instructions from the railroad company purchasing them, and must have the initials of such railroad company." Was it the intention of the committee that a railroad company should not buy wheels having any other initials than its own? For instance, you inspect a lot of wheels, and you reject them. They will not pass the Big Four requirements. They are cast; they have the Big Four initials on them. Is it your intention that those wheels shall not be marketed and that no one else is to buy them? I can easily see that if I buy your rejected Big Four wheels and use them in interchange, I may get you in a hole on them; they are wheels which your testers rejected; I buy them at a low figure and use them on repair work, foreign cars, and they go out with your advertisement. Is there a complication there?

Mr. Garstang—I do not think this association can prevent railroads from buying such wheels as they may think proper. The initials are recommended to be placed on the wheels for the protection of the railroad; first, so that if any particular lot of wheels was condemned we would know which ones they were, and, second, we find that different railroad companies use the same numbers on their wheels. The Pennsylvania will have a wheel "999," the Big Four will have a wheel "999," and some other road may have the same number. We find in auditing bills presented by foreign roads that we cannot tell whether the "999" wheel belongs to the Big Four road or to some other road, and for that reason this is recommended:

Mr. Gibbs—I might say that we have had that problem to face, and do not have Pennsylvania serial numbers. We take the manufacturer's serial number. He runs through a certain number of thousand—I forget how many—then he starts off again, I think, with another letter or something of that sort, and I think the complication arises from the railway company requiring its own serial. You are much better off if you do not ask for a railway serial, but let the manufacturer's serial go, and the chance of duplication then disappears.

W. E. Fowler (Can. Pac.)—I think Mr. Gibbs has lost sight of one of the greatest recommendations of this committee; that is, with regard to the tests made by inspectors before the wheels are received. I don't think the Pennsylvania or any other road has any right to buy a wheel that has been rejected by another road after a proper test. In other words, if wheels are offered by a wheel manufacturer which have already been rejected by the inspector of another road, if the inspector representing the second road does his duty he will also reject those wheels.

Mr. Gibbs—Why, Mr. Fowler? On what grounds?

Mr. Fowler—Because the wheels will not stand the prescribed tests.

Mr. Gibbs—Mr. Fowler, you assume then that because certain wheels fail to stand the test that all of them would fail to stand the test? Experience doesn't show that that is necessarily true.

Mr. Fowler—Nevertheless, that is the principle of the adoption of the test. We have agreed for a good many years to a test of couplers, wheels, air brake hose and everything else by certain representatives who are chosen at random, and in the case of the wheel I do not see how we can avoid applying the prescribed number.

Mr. Lockwood—If I understand Mr. Gibbs' complication exactly, I would say that our skirts would be free, on the Big Four at least, because we keep an individual record, the same as he does, of every wheel that goes into our service, and if a wheel failed and was directly chargeable to the Big Four, or, at least, if some other road brought a claim against us, with the number of that wheel given, we could trace exactly whether it was ever received and accepted by us and put in service, and if not, we would disclaim all responsibility therefor. The records will show that. We had a case only very recently. There were a lot of wheels offered and there was no means of tracing the responsibility unless the initials of the road were chipped on to the wheel or stamped on; and as that has come before the committee several times, it became necessary that the committee should take cognizance of the fact that there was a weak point there. If there is any better way of getting around it, the committee is at a loss to know, but we have the initials on the wheels for the very purpose of protecting the railroad to the greatest degree. Then, if there is a record kept of the individual numbers of the wheels used, I do not see how there is going to be any complication that would cause any serious trouble.

Mr. Gibbs—The point I am trying to get at is this: It strikes me that there is some moral obligation, that if you test and reject wheels, you should remove your initials. You should not leave those wheels lying round loose to get into the general trade. I can imagine there would be some awkward complications in the case of finding a wheel marked with your road, which I buy at some low rate and put it in. If some of these wheel disputes come up that would be taken as prima facie evidence that you had put that in. As a matter of fact, you didn't do anything of the kind. So it seems to me that if you do not want a wheel, that rejected wheel ought not to exist, having your initials; that you ought to have them chipped off if you do not want the wheel.

Mr. Garstang—I think it was about four years ago that the Wheel Committee recommended leaving off the initials for the express purpose of giving the wheel manufacturer an opportunity to manufacture the M. C. B. standard wheel and carry it in stock, the same as the manufacturers of tires do.

But we have found—and I suppose there are other members here that have experienced the same trouble—that we have been charged with a great many wheels that do not belong to us, by the duplication of numbers. Therefore I think it is absolutely necessary to keep individual and correct checks on your own wheels, to have the initials of your road cast on them.

T. H. Curtis (L. & N.)—The matter of the inspection of cast-iron wheels has been brought to my attention lately, where wheels were rejected according to the M. C. B. specifications, and I had reason to believe there was good cause for the rejection. However, the rejecting of these wheels didn't amount to so very much to the manufacturer. It was only a matter of giving the car to somebody else. Those wheels come back in railway service. If there is anything we can do to keep that wheel out of railway service, I think we ought to do it, and putting the initial of the railroad on the wheel, will be, I believe, a step in the right direction.

R. P. C. Sanderson (Va.)—I side with Mr. Fowler and Mr. Curtis on that, and the committee I have personal knowledge of rejected wheels of the kind that Mr. Curtis has spoken of being bought by small railroads and car owners in job lots and put into their cars, notwithstanding they have been rejected previously and for good cause.

D. F. Crawford (Pennsylvania)—I would like to ask what is to prevent the wheelmaker, if he so desires, selling the wheels having the initials "C., C., C. & St. L." on them, that have been rejected, to some other railroad that is not so particular as to the inspection, and those rejected wheels being used under cars bearing the initials of the Big Four, or any other road. I believe it is proper to put the initials of the railroad buying the wheels on the wheels. In fact, I think it must be done. It says here that no two wheels shall have the same number. I do not think a wheelmaker wants to number wheels up into the 9,000,000 and so on, and I am quite sure that the larger roads, at least, cannot keep records of individual wheels. Wheels last a good many years, and to go back to your records and check up a wheel you bought six or seven years ago means a good deal. I agree with Mr. Gibbs that it is a very desirable thing for this association to prevent if possible the use of rejected wheels—wheels which any of us have rejected under cars that run over our tracks. I do not know that chipping the initials off would accomplish that purpose. I am sure that putting initials on won't accomplish that purpose, because I have known of wheels remarked "P. Co.," to have been used on some other cars not "P. Co." cars and bearing the initials. Very few, I am glad to say.

Mr. Lockwood—On the particular wheels last referred to you have a record of the numbers of those wheels which are rejected, have you not? We carry that, and it would be easy to find out just those which were rejected.

Mr. Crawford—Suppose I rejected P. Co. wheel No. 9001 and took a record of it and put it in my office. The X. Y. & Z. railroad, that does not care as much about wheel specifications as I do, buys that P. Co. wheel 9001. I have a record that it is rejected. It goes on to the X. Y. & Z. and fails under defects. Who gets the bill?

Mr. Lockwood—You get the bill.

Mr. Crawford—I thought so. But I didn't buy the wheel; I rejected it.

Mr. Lockwood—But, by reason of your records you can trace it back and repudiate that bill.

Mr. Crawford—Yes, that is a very good theory. But I would like to see it apply in practice with 2,500,000 wheels, some of them 10 years old.

Mr. Lockwood—And one thing more. There are any number of characters in the English language with nine digits and a cipher, all of which we can combine in any way, and we have the privilege, so far as the Big Four wheels are concerned, at least, of assigning the various groups of numbers that shall go on these wheels as we buy them; and the manufacturer brings them into that series, and then if there are any wheels rejected, or a heat is rejected, that entire lot out of that series is obliterated. That is a rejected assignment, and if there are any wheels reproduced with those numbers we will not take them or accept responsibility for them.

Mr. Crawford—Quite right. That is the usual practice, but

the other road can still get them with your number on them, and if they are bad wheels it causes trouble.

Mr. Lockwood—I will agree there is a possibility of that, but I think our protection is as broad as we can make it.

Mr. Crawford—May I ask another question on this subject? Under paragraph 9, section 2, individual wheels will not be accepted which are under minimum weight; all excess weight over the maximum given, to be at the expense of the manufacturer. Is it quite right to include that in the specification? I think that is the function of the purchasing agent and should not be included in the specification of this association.

Mr. Garstang—That clause was inserted in the specifications as much for the protection of the purchasing agents as it was for the members of this association. You will notice the weights of all the wheels have been changed. These weights were arrived at after weighing several hundred wheels made from the M. C. B. patterns, by the different members of the committee. We find that the weights recommended are about the average weights for each pattern of wheel. After a very lengthy conference with the wheel manufacturers it was agreed, not only by the M. C. B. committee, but by the wheel manufacturers' committee, that the weights recommended were fair, and they were willing to comply with them, and they agreed to stand any excess over the maximum weights given.

The President—Is there any further discussion on this subject? If not a motion to submit the recommendations to letter ballot will be in order.

The motion was made and carried.

The next report was on Splicing Sills. I. S. Downing (L. S. & M. S.) presented the report of this committee.

The Secretary—I would like to say that the Arbitration Committee took no action on this recommendation for the simple reason that in Rule 65 it now says: "Cars delivered in interchange with the form of splice shown in Figure 9-B will be accepted." That is the same of the form of splice shown in the report.

Mr. Downing—There is one recommendation in regard to center sills that really is not covered in the rules. There probably would have to be some action taken on that.

J. J. Hennessey (C. M. & St. P.)—I really think this is a very important subject, and I would move that this committee be continued for another year, as to the form of splices. I think this center sill splice is correct. I don't think there is any question about that, where it is properly applied, and I think they might go into it a little further to see just how many splices we may put into a car, and give the different cars for splicing. We have come now to a time, with some of our old wooden cars, when they ought to be allowed, I think, considerable splicing. I make that as a motion, Mr. President, that the committee be continued and make a further report.

The President—And that the matter be referred to letter ballot as the report stands at present?

Mr. Hennessey—As recommended practice.

The motion was carried.

The next committee report was on Tank Cars. At the request of the chairman of the committee, R. L. Kleine (Penna.) presented the report.

Discussion on Tank Cars.

Mr. Kleine—I might say that the vents marked A and B and shown in the committee's report are patented devices. This your committee learned after they had designed the vents and printed them in the report, and we believe it would be a good thing to show them in the report but not submit the vents A and B for recommended practice.

R. P. C. Sanderson (Virginian)—As I understand it, the recommendations are to be modified, omitting the recommendation of those two patented devices, A and B.

The President—Yes, that is to be eliminated on the statement of the chairman.

Mr. Sanderson—I move that the report be submitted to letter ballot on the recommendations of the committee.

D. F. Crawford (Penn. Lines)—I wish to amend the motion that this Committee on Tank Cars be continued. I do not think the entire subject has been cleaned up. I believe the committee should be continued for another year at least.

The amended motion was carried.

The next report was on Safety Appliances. It was read by Mr. Seley.

Discussion on Safety Appliances.

Mr. Seley—I might say, in addition, that the committee has received a few communications on minor matters since the date of the closing of the report, April 1, and these matters will be taken up and presented with the next report of the committee.

F. W. Brazier (N. Y. Cent.)—It was my duty to appear before a committee of Congressmen in Washington last spring. There was a bill before Congress which aimed to make the M. C. B. rules the law of the land. I had a great many pertinent questions put to me by that Congressional committee. I tried to show them that the M. C. B. rules were made by practical car men and not by members of organizations that were demanding changes, etc. I impressed upon them that we knew what we were talking about and that what we wanted was right. They asked me a question: How many inches do you think the grab handle should be from the edge of the roof? I made my answer by getting up on the table and showed them that the way we had located the handle it was all right. The next question was: How long do you think it would take to come to a standard location of roof handles? I told them that I thought it would take about four years; by that time the old equipment would probably be wiped out, and that would give us time in which to have a standard location of the roof handles.

We are indebted to the Hon. Mr. Moseley, secretary of the Interstate Commerce Commission, for this clause 4. They have practically adopted the M. C. B. rules in the Canal Zone. I also said before this Congressional committee that it was our opinion that the M. C. B. rules were as near correct as we could make them, and we did not want any changes. The bill, I understand, will go through just as it is drawn.

About the location of handles on passenger cars, we have foolishly put them o nour open platforms. I did not think they were called for, but most of the railways in the country adopted them and we followed suit. If we had taken action two years ago and said that we thought it was foolish, none of us would have put them on.

Speaking about paragraph 45, I think the member who wrote the letter stating that we should allow these matters to remain in a stable condition for a few years, and that we should make very few changes, is on the right track, because we will get our foot into it if we begin to make too many changes that we cannot keep up with.

William Garstang (C., C., C. & St. L.)—I think the matter of hand holds on roofs of box cars should be given very careful consideration, and it should have more attention than this association has given to it in the past. We find the hand hold on the roofs located all the way from two or three inches from the edge of the roof up to 15 and 16 inches. I do not think a hand hold located within 2 or 3 inches of the edge of the roof gives a good leverage by which a man can lift himself from the top round of the latter on to the top of the roof. I think we should agree on some specified distances and work to that end

Mr. Hennessey—Take, for illustration, the hand holds on refrigerator cars; it would not be advisable to locate them on those cars the same as on box cars, in fact you could not do it. Your hatchway is where the M. C. B. recommendations would place the hand hold. The recommendation is not arbitrary and I believe it should not be made arbitrary, because in certain construction of cars you cannot meet the requirements, especially on refrigerator cars.

The recommendations as contained in paragraph 46 were ordered submitted to letter ballot.

The next report was that on Side Bearings and Center Plates. R. D. Smith (B. & O.) presented the report.

(The Discussion on Side Bearings and Center Plates will appear in to-morrow's "Daily.")

A RIOT ON THE PIER.

It required the united efforts of practically all of the railway men attending the conventions to stop what would have been a serious riot and no doubt have cost the loss of many lives on the pier on Monday morning. At an early hour there appeared a body of men armed with picks, shovels, clay pipes and other implements of war, and, strange to relate, they were all Irish. The cause of the disturbance seems to have been the failure of the president of the Hod Carriers' Association, one J. J. McCarthy, to appear, and the report had been circulated that he had either been bought by some of the manufacturers or captured and sequestered by them. If bought, they wanted a division of the spoils; if captured, they wanted him released. It required a large number of drinks (and other arguments) to quiet the disturbance. President McCarthy will receive a bill for the arguments.

L. C. Fritch, Consulting Engineer, Illinois Central, is present at the convention as delegate from the American Railway Engineering and Maintenance of Way Association, to

(*Continued on page* 1467.)

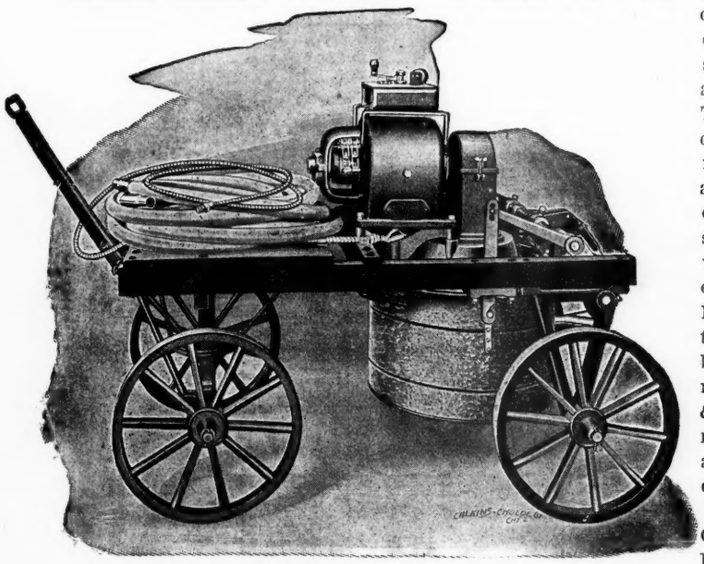
DUNTLEY DISINFECTOR AND PNEUMATIC CLEANER.

The Duntley Manufacturing Company, Chicago, is putting on the market the two new devices here illustrated, which are

Duntley Disinfector.

said to be very efficient for cleaning and fumigating passenger cars.

The Duntley disinfector is designed for use with any size of Duntley pneumatic cleaner, for fumigating in hospitals, residences, passenger coaches, etc. It is claimed that it will



Duntley No. 5 Pneumatic Cleaner.

do the same work in 30 minutes that the ordinary method now in use requires six to eight hours to do.

The Duntley No. 5 pneumatic cleaner is designed for cleaning cushions, aisle strips, blinds and everything pertaining to passenger cars.

Among the claims made for this cleaner are the following: It will remove every particle of dust and dirt to the cleaner and deposits it in the dust tank; force fresh air through the pillows, mattresses, cushions, etc., of the Pullman cars; do everything that a vacuum cleaner can do; operate by electric motor, suitable for any current conditions, or where electricity is not available, it can be equipped with gasolene engine.

The Standard Tool Company, Cleveland, O., is exhibiting a flat twisted, or forged drill, which is made in one solid piece with a standard taper shank, requiring no expensive or special sockets, regular sockets or sleeves being used. These drills are suited for maximum feeds and speeds and are said to give accurate results. The exhibit also includes an economy socket, which corrects tang troubles efficiently and practically at a minimum cost.

STRENGTH OF THE BOLSTER.

The corrugated web of the Bettendorf bolster, shown at booth 200, has a special significance. It is a guarantee in itself of good material and workmanship. The strength of a bolster and its ability to withstand constant repetitions of load depend largely upon construction as well as upon design.

The webs of the Bettendorf bolsters are shaped cold in large hydraulic presses. In this way forging stresses which would arise through heating the metal are eliminated. With this bolster which is carefully tested before it leaves the shop, there is no danger of breaking down in service. There are other points in Bettendorf bolster design and construction which will be explained to you, but it might be well to ask about the method of corrugating webs.

Taking into consideration the present orders covering about 8,000 bolsters, there will soon be in service about 500,000 Bettendorf bolsters. The service, which they have given, is a record of satisfactory design and manufacture.

CELFOR TOOLS.

The Celfor Tool Company exhibit at spaces 133 and 135, Machinery Hall, is attracting much interest. This exhibit contains a large line of the well-known Celfor drills, reamers, chucks, countersinks, flue-cutters, etc. This is the sixth consecutive year that the Celfor Tool Company has shown its tools at the conventions of the M. M. and M. C. B. associations. Two years ago it showed for the first time its Celfor twist drills which have now become standard in a large number of railway and other shops. At that time the drill was new and attracted much attention. Last June the company had a more extensive exhibit than in 1907, in which the Celfor drills were shown in operation, and many remarkable demonstrations were made. This year a much larger and even more interesting exhibit is being made. An unfortunate accident to the large radial press in the Celfor company's space has prevented them from showing working demonstrations of their own; but through the kind courtesy of the Celfor Tool Company's neighbors the Cincinnati-Bickford Company and Hill, Clarke & Co., the capacity of the Celfor tools is being shown by the many remarkable trials on the powerful new radials in the adjoining booths and in the Manning, Maxwell & Moore exhibit opposite.

The Celfor Tool Company is represented by Messrs. E. B. Clark, William Brewster, M. L. Hamlin, W. E. McCabe, J. J. Dale, E. B. Ross and C. A. Bucher. A visit to this most interesting exhibit will repay anyone.

The American Car and Foundry Company has taken exhibit space for the first time at the M. M. and M. C. B. conventions and has tastefully furnished and decorated spaces 552 and 553 in the Annex. The location is a most excellent one, as the space runs between the two main aisles of the Annex, fronting on both, and is one of the three spaces nearest to Convention Hall, in which the railroad men assemble. The inviting booth is occupied daily by leading railway men and those prominent in the railway supply world. It is to be regretted that President F. M. Eaton and Vice-President and General Manager E. F. Carry could not come to Atlantic City and greet their many friends from the booth. The company is ably represented, however, by Scott H. Blewett, John McE. Ames, William C. Dickerman, George Johnson, Clark D. Eaton, S. S. DeLano, A. E. Ostrander, William M. Hager, P. P. Sturdevant and M. H. Sanford.

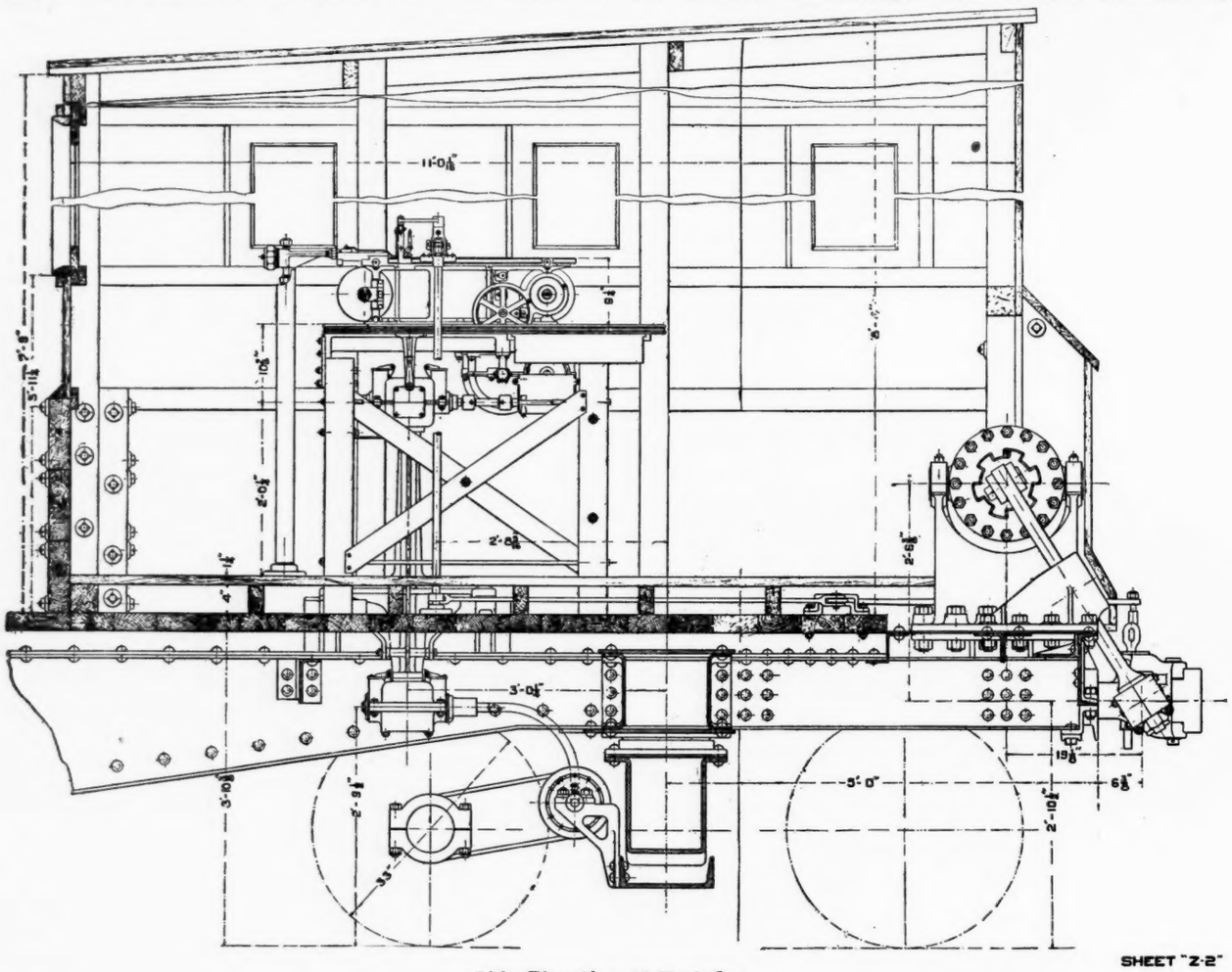
COUPLER AND DRAFT EQUIPMENT.*

Face Tests.—In the coupler reports for 1907 and 1908, figures were given showing the result of extensive investigations of coupler breakages, which demonstrated conclusively that a large percentage of all coupler failures are due to breakage through the face or front wall. The tests embodied in the present specifications do not cover this weak point in couplers; therefore, the committee made some preliminary experiments last year with a view of devising some test which would break the couplers through the face similar to the manner in which they are broken in service. The results of these preliminary trials were given in last year's report. The investigation has now been completed and the results from sixty-nine couplers tested to destruction, with drawings of apparatus for testing, are shown on sheets A to J, inclusive. [Sheet A, not reproduced here, gives summarized details of the tests. Average values for results of tests are given on succeeding charts. Sheet J also not reproduced.]

These couplers, furnished both by different railway companies and by manufacturers, were tested with the apparatus shown on sheets G. H. and I. [Sheet H only reproduced herewith.] Fifty-seven of the couplers tested represented the standard types on the market at the time of testing; nine were special couplers manufactured for the face test and were tested by request of the manufacturers, and the remaining three were malleable iron couplers. The manufacturers were invited to be present at the tests of their respective couplers and the majority availed themselves of this opportunity. The following conclusions, from which the details of the new test are recommended, are based on the fifty-seven regular couplers. It will be noted, however, that the nine special couplers gave slightly better results, showing the feasibility of procuring additional strength.

The coupler shank is wedged and bolted in the base-block casting with the striking horn and butt resting on the block and anvil. The wedging block shown on sheet H, which is slightly modified from the one shown in the report of last year, to give more wedging action, is placed in the coupler head bearing on the lugs and guard arm of the coupler. Blows imparted by the drop on the wedging block produce a spreading action on the coupler head, forcing the lugs and guard arm apart, which almost invariably breaks the coupler through the front wall. Reference to sheet F, giving the location and percentage of breaks in each place, shows the similarity to the service failures.

The couplers were subjected to three blows of five feet, followed by blows of ten feet until failure occurred. A coupler was considered to have failed when it was broken or when any cracks appeared more than $^1/_{16}$ inch wide or more than one inch long. The average number of blows (see sheet B) sustained by the fifty-seven regular couplers was three at five feet and one and one-half at ten feet, but as there were four out of eleven types which averaged better than this, and four additional types which had one or more couplers do better, your committee believes it proper to recommend that the test embody three blows at five feet and two blows at ten feet, with provision for re-tests provided the coupler stands three blows at five feet.



Side Elevation of Test Car.

As explained above, the action of the wedging block when subjected to blows spreads the lugs and guard arm apart; it also bends the head on the shank just back of the striking horn. These deflections were carefully noted during each test and are shown on sheets D and E, for all couplers on which these distortions could be measured after the second blow at ten feet. The deflections on the top of the coupler vary slightly from those on the bottom, but it does not seem necessary to specify limits for both top and bottom. The committee recommends that the limit for allowable deflection be ¾ inch for the guard arm for both 5 by 5 and 5 by 7 inch

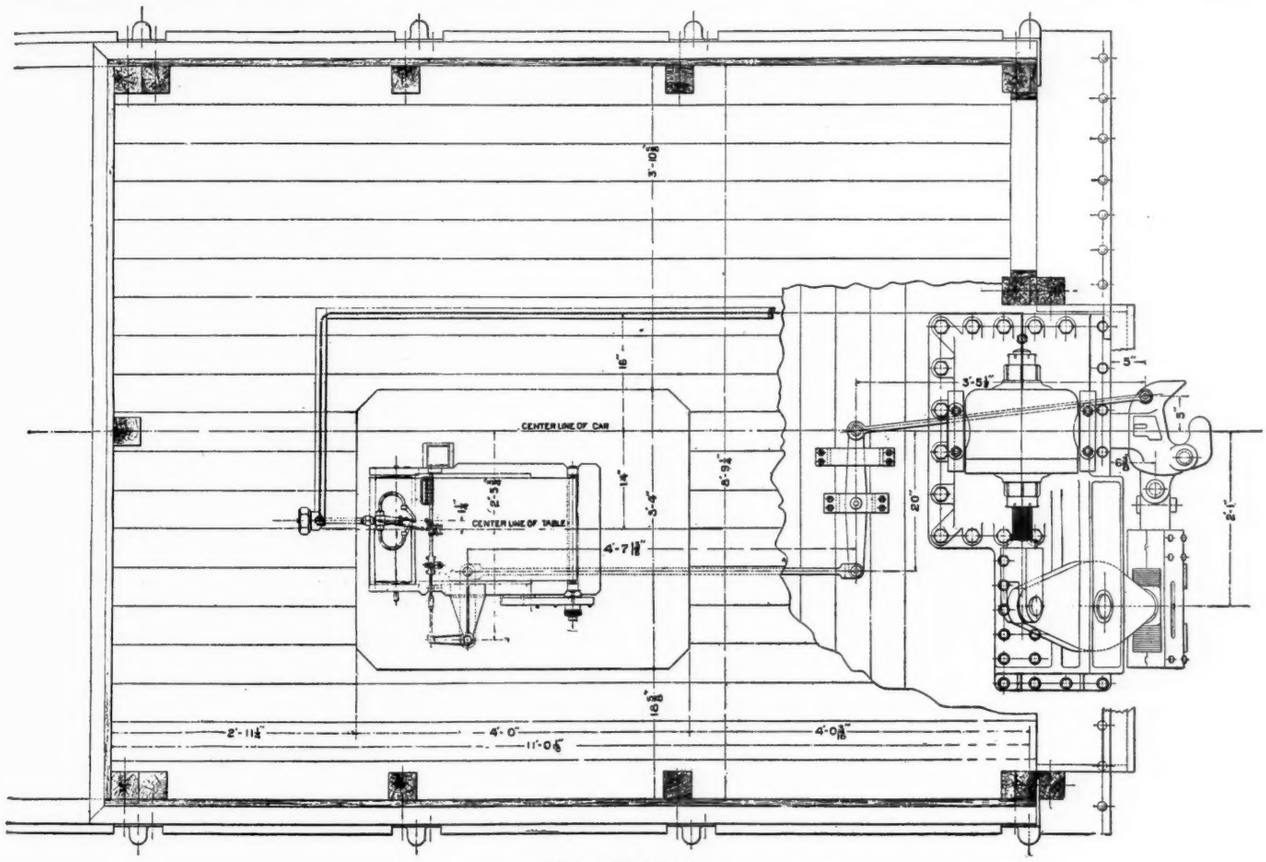
*Report presented at the annual convention of the Master Car Builders' Association. Committee: R. N. Durborow (chairman), F. W. Brazier, T. H. Curtis, T. Roope, G. W. Smith, F. H. Stark, G. W. Wildin.

couplers; and 7/16 inch for 5 by 7 inch, and 9/16 inch for 5 by 5 inch shank couplers for the head and shank; both to be measured in the same manner as specified in the present guard-arm test. These limits are somewhat more liberal than might be considered advisable from the average of the recent experimental tests, which seems only fair, in that some of the couplers failed on account of the metal being too hard or brittle, which could possibly have been made of a trifle softer material without injuring their fitness for service.

In the 1908 coupler report it was recommended, and the recommendation subsequently passed the letter ballot, that all new types of couplers put on the market after January 1, 1909, have the dimension from the back of striking horn to inside face of knuckle increased one-half inch, and that the face or front wall must have a minimum thickness of 1¼ inches. The wisdom of this recommendation has been brought out by the experimental face tests, in which the couplers having the thickest front wall generally stood the largest number of blows (see sheets B and C). There were exceptions to this, but a careful study of the results will show that these exceptions were due to one or the other of the following two reasons: First, some of the comparatively thick-faced couplers did not stand as many blows as some having thinner walls, due to kind of metal, improper annealing or defective castings. Second, some of the thin-faced couplers stood a comparatively large number of blows, due to soft metal allowing the guard arm to spread without breaking, but in most of these cases this guard-arm deflection was excessive and indicated that the coupler would not be sufficiently rigid to properly withstand service shocks. The required number of blows and the allowable limits of guard arm and head deflections should prevent either of the above undesirable results.

The committee believes that physical tests will insure satisfactory couplers, and that the chemical composition should be left to the judgment of the manufacturer; however, chemical analyses were made to ascertain the relation between the chemical and the physical properties as brought out under the face test. At the last convention some of the members thought it desirable to incorporate in the specifications chemical analyses for the steel in the couplers in addition to the physical tests. The committee has very carefully considered this question at different times and found that the manufacturers strongly object to the chemical specifications in addition to the physical tests, claiming that this restricted them to such an extent that they would have difficulty in meeting the physical tests. The committee feels that this point is well taken and believes that the physical tests prescribed for couplers are sufficient to insure couplers of proper strength being procured. Sheet A [not reproduced herewith], giving the details for each coupler tested, shows a comparison between the physical and chemical properties. Within fairly wide limits the chemical composition of the metal does not have a fixed relation to the strength of the coupler. In other words, certain chemical constituents proper for one coupler are not necessarily advisable for another, due to different design, thickness of metal, etc.

It was found that the face test, in addition to the special vital features mentioned above, performs all the functions of the present guard-arm test, with the exception of the manner in which the shank is bent. The guard-arm test usually bends the shank throughout its entire length, while the face test only distorts it a few inches back of the striking horn, but as the shank-bending feature is also covered in the striking test, it is recommended that the guard-arm test be abolished and the face test substituted.



Plan of Test Car

Recommended Changes in Specifications.—The present pulling test requires the use of two couplers. When a failure occurs, one coupler almost invariably gives out before the other and hence the one coupler only is being tested to destruction. This being the case the second coupler seems superfluous, and it is, therefore, recommended that one coupler be subjected to this test and that a dummy be used in place of the second coupler. This has been tried in several places for some time and found perfectly satisfactory. Previous to 1904 the jerk test embodied the use of two couplers, but has been found just as effective with one.

An outline of the proposed tests to be embodied in the specifications compared with the present is as follows:

Present Tests.		*Proposed Tests.*	
Striking test	10 couplers.	Striking test	10 couplers.
Guard-arm test	1 coupler.	Face test	2 couplers.
Jerk test	1 "	Jerk test	1 coupler.
Pulling test	2 couplers.	Pulling test	1 "
Total	14 couplers.	Total	14 couplers.

The one coupler gained by reducing the number employed in the pulling test is given to the face test.

A large number of bent and badly worn knuckle pivot pins are still found in service, necessitating very frequent renewals. Thorough examinations of pins removed from service have clearly demonstrated that the types which meet the specifications give comparatively very little trouble, and with the following exception these specifications have been found satisfactory:

The specifications for knuckle pivot pins, section 3, first sentence, require that the pins must enter the plus end and must not enter the minus end of the recommended M. C. B. limit gage for 1⅝ inch round iron. This allows a total variation of .022 inch or only .011 inch above or below 1⅝ inch. As it has been found extremely difficult to procure steel within these limits, and as the committee believes them unnecessarily severe, it is recommended that a variation of 1/64 inch above or below 1⅝ inch diameter be allowed.

For the sake of clearness the committee recommends that the weight of drop, namely, 1,640 pounds, be specified in the first sentence under "Physical Test."

Sheet L gives a statement showing tests of nine different types of pins. The average angular distortion of only three types and all the pins of only one type meet the specifications. From this it is quite evident that many railways are not buying knuckle pivot pins in accordance with the specifications. The committee, therefore, strongly urges the members to insist upon the observance of these requirements, and recommends that the specifications for knuckle pivot pins, which have been Recommended Practice for two years, be advanced to a Standard of the Association with the changes herein recommended.

It has been found that the regular jerk, striking and pulling tests embodied in the specifications for automatic couplers are not severe enough on the knuckle pins. Couplers with very soft pins will operate after these tests, as the engaging shoulders on the knuckles and bars and the knuckle tail hook have protected the pin from excessive bending. In service, however, these pins, becoming bent and shouldered, materially decrease the life of the coupler by increasing the engaging distance from point of knuckle to guard arm and by lessening the knuckle tail and lock-bearing surfaces. The committee, therefore, recommends that when couplers are inspected that a certain number of the knuckle pivot pins be tested in accordance with the pivot-pin specifications.

The present coupler specifications, section 5, third sentence, and the separate knuckle specifications, section 4, third sentence, require that the holes for knuckle pins must not be more than 1/16 inch larger than the pin. Inasmuch as the specifications for knuckle pivot pins allow a variation of only 0.011 inch each way, or 1/64 inch if the recommended change is adopted, 1/32 inch variation in the hole will insure the entrance of the pin without difficulty. Larger holes mean loose pins, with consequent wear and decrease in the life of the couplers. This change is therefore recommended.

A slight modification has been made in the apparatus for testing knuckle pins. The guide of the striking block was found to be of insufficient depth; 2¼ inches have, therefore, been added to the guide and to the block. The drawing as changed is shown on sheet M [not reproduced herewith]. As the modification is a minor one, the drawing has been changed without reference to letter ballot.

Some types of couplers are equipped with a device for preventing the lower portion of a broken knuckle pin from falling out. This tends to protect the upper lug from breaking when it receives the increased strain occasioned by a portion of the pin dropping out of the lower lug, but an arrangement of this kind makes it difficult for inspectors and others to detect broken pins. If a coupler is properly designed and fitted, the knuckle tail hook should prevent excessive strain to the upper lug. Under these circumstances the committee does not consider it wise at the present time to recommend a device for supporting broken knuckle pins.

The coupler specifications require that the name of the coupler appear on each knuckle, but this requirement does not appear in the specifications for separate knuckles. The similarity of some knuckles of different makes as well as the large number of different types in service make it extremely desirable to have the name of the coupler shown on each knuckle. This is a great help to repairmen and often is the means of avoiding rather serious mistakes. For this reason the committee recommends that this requirement be incorporated in the specifications for separate knuckles.

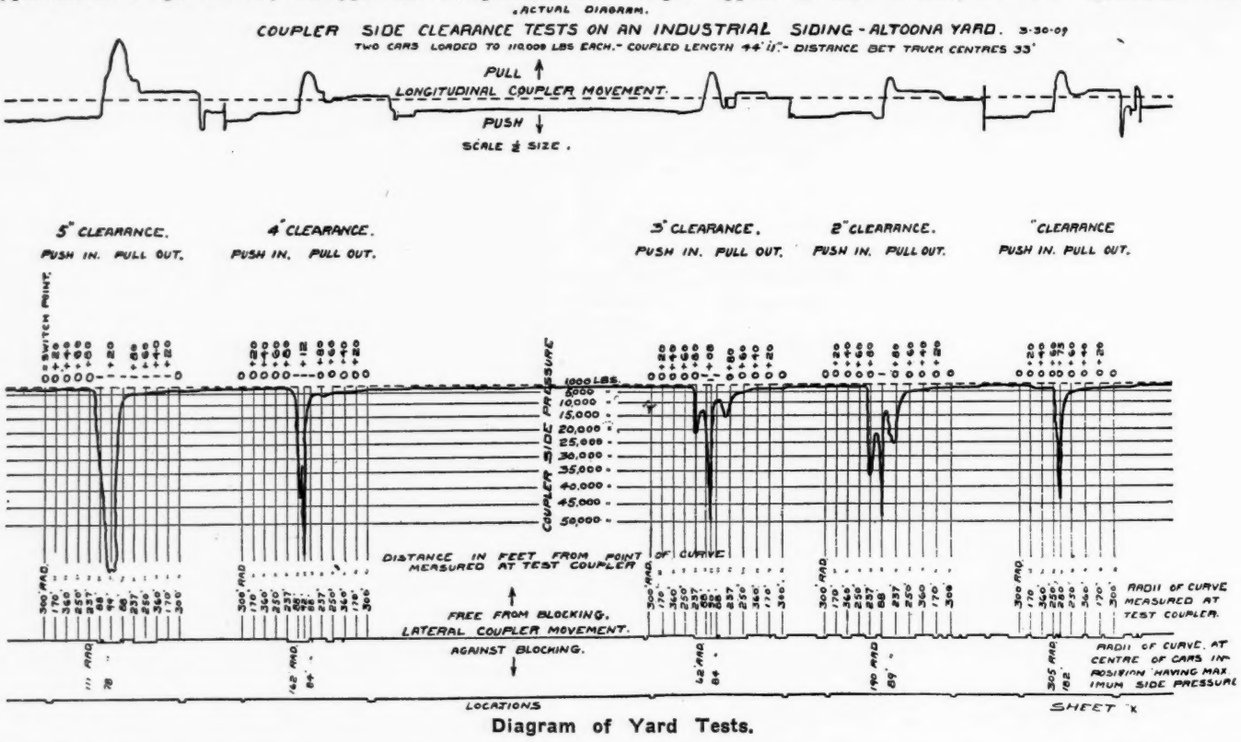


Diagram of Yard Tests.

Proposed Inspector's Gages, Attachment of Yoke to Butt and Changes in Drawings.

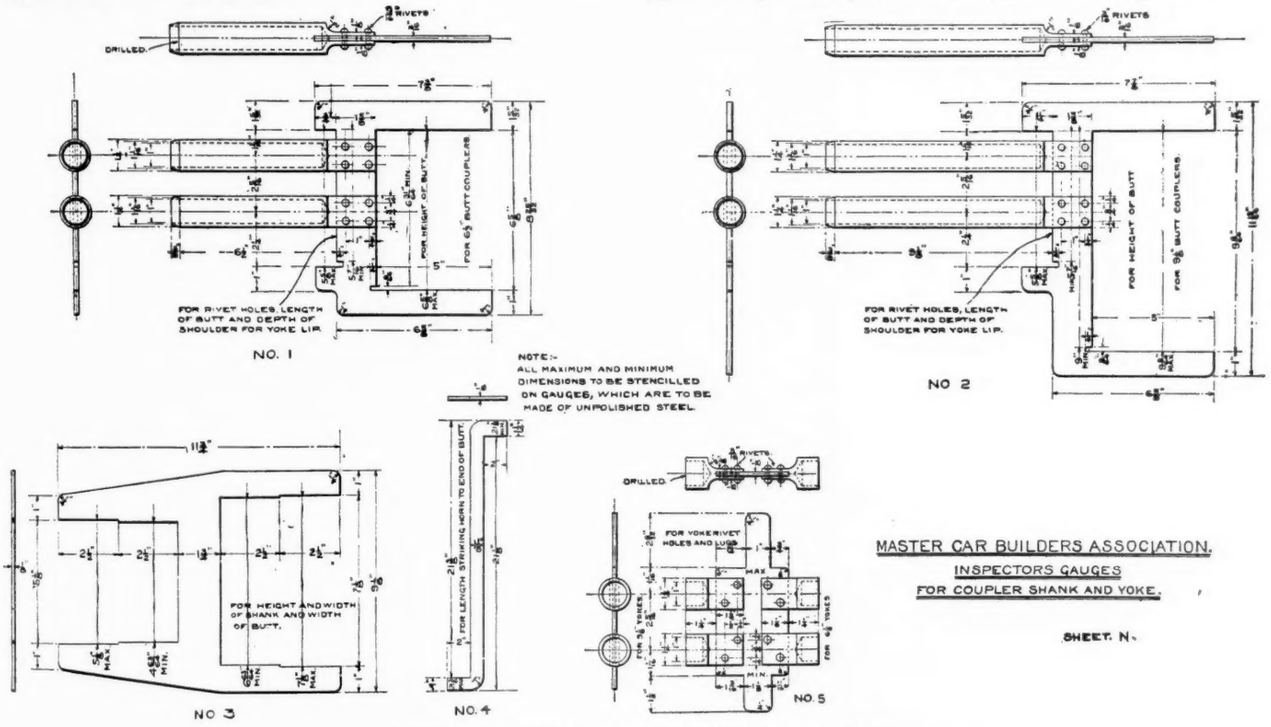
Inasmuch as it is not practicable to work to absolutely square corners in foundry and blacksmithing practice, the committee recommends that sheets M. C. B.-11 and M. C. B.-B, be changed to conform to sheets O and P [not reproduced herewith], which show ⅛-inch radius on the inside of yoke lip and 3/16-inch radius on corner of coupler butt. As it is practically impossible to upset the yoke ends to a square corner on the inside, the yoke cannot fit squarely unless a radius is provided on the corner on the coupler butt.

In the 1907 report the committee made reference to the method of attaching yokes to butts. To insure proper fitting, gages for both couplers and yokes have been designed and tried out, and it has been found that where couplers and yokes have been fitted to these gages very little trouble is experienced. The gages are shown on sheet N. No. 1 is used on 6½-inch butt couplers to gage rivet holes and lug for yoke fitting, length of butt and height of butt. No. 2 is the same for 9⅛-inch butt couplers. The tubes on gages Nos. 1 and 2 are of sufficient length to pass completely through the coupler

butt, therefore, if they are applied from both the top and bottom of the coupler, they will insure the top and bottom of the butt being in line as well as the proper spacing of the rivet holes. No. 3 gages the width and height of shank and width of butt on both 5 by 5 and 5 by 7 inch shank couplers. No. 4 gages the length of shank from back of striking horn to back of butt on both 5 by 5 and 5 by 7 inch shank couplers. No. 5 gages the rivet holes and the lips on all yokes.

As commented upon in the 1908 report, the trouble developed with the present method of attaching yokes to butts is due to improper fitting, such that the yoke lips stand away from the coupler butt and place all the strain on the rivets, which causes the latter to shear. If the use of the above gages is rigidly observed the fitting will be such as to place nearly all the pull on the yoke lips and relieve the rivets from practically all shearing strain. The limits as decided are based on the experience of several years, and while fairly strict, they are as liberal as is consistent with strength and proper fitting.

For the benefit of manufacturers as well as those purchasing couplers, the committee recommends that the allowable maximum and minimum dimensions conforming to the gages be added to sheets M. C. B.-11 and M. C. B.-B, as shown on sheets O and P, and that the gages shown on sheet N be made Standard of the Association.


DRILLED
RIVETS
FOR RIVET HOLES, LENGTH OF BUTT AND DEPTH OF SHOULDER FOR YOKE LIP.
FOR HEIGHT OF BUTT
FOR 6½" BUTT COUPLERS
NO. 1
NOTE:- ALL MAXIMUM AND MINIMUM DIMENSIONS TO BE STENCILLED ON GAUGES, WHICH ARE TO BE MADE OF UNPOLISHED STEEL.
FOR 9⅝" BUTT COUPLERS
NO 2
FOR HEIGHT AND WIDTH OF SHANK AND WIDTH OF BUTT.
NO 3
FOR LENGTH STRIKING HORN TO END OF BUTT
NO. 4
FOR YOKE RIVET HOLES AND LUGS
NO. 5
MASTER CAR BUILDERS ASSOCIATION.
INSPECTORS GAUGES
FOR COUPLER SHANK AND YOKE.
SHEET N.

Inspectors' Gages for Coupler Shank and Yoke.

Mating of Couplers.—As mentioned in the report of last year, the contour of the knuckle tail on many couplers does not coincide with the contour of the coupler head; this leaves an opening between the knuckle lines and the lines of the coupler head when the knuckle tail is closed and often prevents easy couplings, as the point of the mating knuckle cannot engage the knuckle tail continuously until the lock drops. If both knuckles of two engaging couplers are of the correct contour, the couplers will mate readily at very slow speed, but if the knuckles have the above-mentioned incorrect lines, they are only closed by coming sharply in contact with the front wall of the coupler heads. In other words, the knuckles should close each other and should not be pushed shut by the face of the opposing coupler. A note has been incorporated in the recommended revision of sheet M. C. B.-11, requiring the knuckle contour to coincide with the contour of the coupler head to the point where the lines of the knuckle tail diverge from the lines of the coupler face when the knuckle is closed, insuring the knuckle lines coinciding with the coupler contour lines as far as practicable.

Many couplers do not provide for a full knuckle opening; this lessens the available space into which the opposing coupler knuckle must enter and often prevents couplers from mating. The position and shape of the lugs on some couplers cause the same trouble by not providing sufficient opening across the coupler head from lugs to guard arm. To avoid the above, the committee recommends that the line tangent to the inside of the lugs must not be less than one inch from the longitudinal center line of coupler and that the knuckle must open sufficiently to clear this line. This recommendation is also shown on sheet O.

Details of Changes in Specifications.

The detailed wording covering the recommended changes in coupler specifications referred to above is given below as it should appear in the specifications if the changes are adopted. Sheet K shows portion of diagram accompanying present coupler specifications, with changes in the limits to conform to the recommended face test. The change in test No. 1 and test No. 3 is simply the correction of an obvious mistake in the wording.

Recommended Changes in Coupler Specifications.—Section 2. After figure "1,014" in second line, add the words "and six additional knuckle pivot pins." After word "Couplers" in third line, add the words "or knuckle pivot pins."

Sec. 4. Add the following to third sentence, "and in every way conforming to the requirements as stated in the specifications for knuckle pivot pins." Omit fourth sentence.

Sec. 5, third sentence, reading "The holes for pivot pins in lugs of bars and knuckles . . . must not be more than $^1/_{16}$ inch larger than pin," change "$^1/_{16}$ inch" to "$^1/_{32}$ inch."

Sec. 6, change last sentence to read as follows: "The dimensions of butt and shank must be within the limits of variation shown by the M. C. B. Standard drawings and inspector's gages."

Sec. 1 under "Inspection," add the following sentence to first paragraph: "Standard M. C. B. gages must be used in gaging all parts for which gages are provided."

Sec. 1 under "Inspection," add the following paragraph: "If the lot of 1,000 couplers is accepted on previous test, the inspector shall take at random from the accepted couplers, five pivot pins, and from the extra six pivot pins, one, making a total of six, which shall be subjected to the requirements of the specifications for knuckle pivot pins. If these pins pass the required inspection and tests, the couplers complete may be accepted. If the pins do not pass the inspection and tests prescribed in the specifications for knuckle pivot pins, the manufacturer will be required to present a new lot of 1,000 pivot pins, which shall be tested in accordance with the requirements of the specifications for knuckle pivot pins. If these are accepted, then the manufacturer will be required to remove all of the former lots of pins in the couplers otherwise acceptable, and substitute the lot of pins which has been accepted."

Change present Section No. 2, under "Inspection," to read as follows:

2. From each 1,004 couplers accepted by test No. 1, four complete couplers shall be selected by the inspector, two of which shall be subjected to test No. 2, one to test No. 3 and one to test No. 4 hereafter specified. If any coupler fails to stand the prescribed test, but before failing stands a sufficient number of blows to make a retest admissible, a second coupler shall be taken from the same lot or lots from which the first was taken. For instance, if the coupler selected for test No. 3 has been taken from the fourth one hundred couplers, and the failure allows a retest, a second coupler shall be taken from the fourth one hundred couplers. If it stands the test, that lot of one thousand couplers shall be accepted as far as that test is concerned, otherwise that lot shall be rejected and another lot of one thousand couplers substituted. Any part of any coupler which has been subjected to test is condemned for service.

Change present test No. 2 under "Physical Tests," to read as follows:

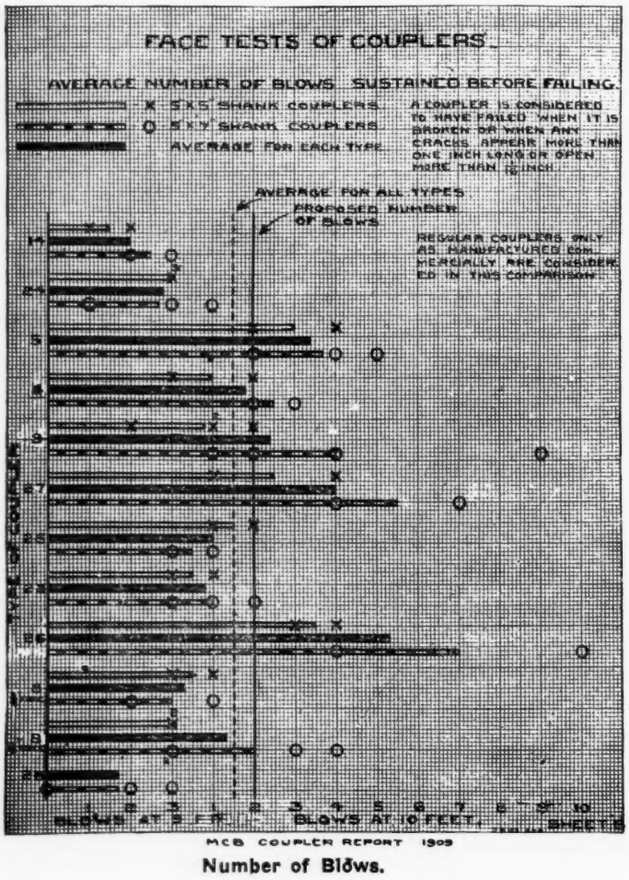
Test No. 2—Face Test.—As a preliminary, pivot pin, knuckle and locking device having been removed, the coupler must be marked on bottom with a center-punched line (see points 1, 2 and 3 in figures 3 and 4) parallel to axis of shank and extending to the contour face. Center-punched marks must also be placed at the end of guard arm and on the lug (see Fig. 3). The base-block casting having been placed in the drop-test machine, the coupler must be set in the casting in a vertical position. The bolts must be drawn tight against the sides of the coupler shank and must be so adjusted that the central vertical plane of coupler shank parallel to the axis is $2^1/_{16}$ inches from line through centers of legs of machine. Wedges and fillers must be placed between bottom of coupler shank and sloping wall of hole in base-block casting and sledged down tight, the top of coupler shank to bear directly on vertical wall of hole in base-block casting. The striking horn of coupler must rest firmly on top of base block and the butt end must be so lined up as to have a solid bearing on the anvil. The bolts must be tightened and the sledging repeated after each blow. The wedging block, after having been gaged to see that its contour line is correct, must be so placed in the coupler head as to have a bearing on lugs and guard arm, and must be readjusted after each blow.

Blows to be struck on wedging block.

Three blows of 1,640 pounds falling five (5) feet.

Two blows of 1,640 pounds falling ten (10) feet.

The coupler shall be considered as having failed to stand this test if it is broken before it has received three blows at five feet and two blows at ten feet, or if any crack appears more than one inch long or open more than $^1/_{16}$ inch, or if the center-punched line is distorted more than $^7/_{16}$ inch for 5 by 7 inch shank or $^9/_{16}$ inch for 5 by 5 inch shank couplers, or if the distance between center-punch marks on bottom of head has widened more than ¾ inch. For method of measuring these distortions see Figs. 3 and 4. Should the coupler before failing stand three blows at five feet, another coupler shall be provided and tested as per Section 2 under "Inspection," governing retest.


FACE TESTS OF COUPLERS.
AVERAGE NUMBER OF BLOWS SUSTAINED BEFORE FAILING.
X 5X5 SHANK COUPLERS.
O 5X7 SHANK COUPLERS.
AVERAGE FOR EACH TYPE.
A COUPLER IS CONSIDERED TO HAVE FAILED WHEN IT IS BROKEN OR WHEN ANY CRACKS APPEAR MORE THAN ONE INCH LONG OR OPEN MORE THAN 1/16 INCH.
AVERAGE FOR ALL TYPES
PROPOSED NUMBER OF BLOWS
REGULAR COUPLERS ONLY AS MANUFACTURED COMMERCIALLY ARE CONSIDERED IN THIS COMPARISON
BLOWS AT 5 FT.
BLOWS AT 10 FEET.
M.C.B. COUPLER REPORT 1909
SHEET L

Number of Blows.

TEST OF KNUCKLE PIVOT PINS

TYPE A								TYPE 23						
NUMBER	1	2	3	4	5	6	AVERAGE	1	2	3	4	5	6	AVERAGE
DIAMETER	1 3/8"	1 1/2"	1 1/2"	1 1/2"	1 1/2"	—	—	1 3/8"	1 3/8"	1 3/8"	1 3/8"	1 3/8"	1 3/8"	—
ANGULAR DISTORTION	92°	96°	95°	99°	100°	99°	97°	29°	29°	35°	25°	35°	31°	32°
TYPE 5								TYPE 24						
NUMBER	1	2	3	4	5	6	AVERAGE	1	2	3	4	5	6	AVERAGE
DIAMETER	1 3/8"	1 3/8"	1 3/8"	1 3/8"	1 3/8"	1 3/8"	—	1 3/8"	1 3/8"	1 3/8"	1 3/8"	1 3/8"	1 3/8"	—
ANGULAR DISTORTION	24°	31°	32°	25°	24°	32°	28°	83°	79°	84°	82°	82°	83°	82°
TYPE B								TYPE 25						
NUMBER	1	2	3	4	5	6	AVERAGE	1	2	3	4	5	6	AVERAGE
DIAMETER	1 3/8"	1 3/8"	1 3/8"	1 3/8"	1 3/8"	1 3/8"	—	1 3/8"	1 3/8"	1 3/8"	1 3/8"	1 3/8"	1 3/8"	—
ANGULAR DISTORTION	84°	83°	82°	81°	83°	78°	82°	36°	28°	20°	36°	28°	37°	31°
TYPE 8								TYPE 9						
NUMBER	1	2	3	4	5	6	AVERAGE	1	2	3	4	—	—	AVERAGE
DIAMETER	1 3/8"	1 3/8"	1 3/8"	1 3/8"	1 3/8"	1 3/8"	—	1 3/8"	1 3/8"	1 3/8"	1 3/8"	—	—	—
ANGULAR DISTORTION	56°	57°	58°	55°	55°	55°	56°	68°	76°	72°	69°	—	—	71°
TYPE 14								TESTED IN ACCORDANCE WITH M.C.B. RECOMMENDED PRACTICE PINS SHOWING A DISTORTION OF LESS THAN 15° OR MORE THAN 35° HAVE FAILED IN THIS TEST. NOTE-TYPES 9 AND 14 ARE LOCOMOTIVE TENDER TYPE AT 5 BLOWS EACH						
NUMBER	1	2	3	4	—	—	AVERAGE							
DIAMETER	1 3/8"	1 3/8"	1 3/8"	1 3/8"	—	—	—							
ANGULAR DISTORTION	65°	71°	67°	56°	—	—	65°							

M.C.B. COUPLER REPORT 1909 SHEET L

Tests of Knuckle Pivot Pins.

Change present test No. 4 under "Physical Tests" to read as follows:

Test No. 4.—Pulling Test of Complete Coupler.—One complete coupler shall be supported in the machine by yoke forgings and locked as in running position to a dummy, the axes of the coupler and dummy to be in the same straight line. The dummy must have the contour lines of an M. C. B. coupler, with the exception of the guard arm, which may be omitted. The coupler must stand a steady pull of 150,000 pounds. A coupler shall be considered as having failed to stand this test if it is broken before it has been pulled the prescribed number of pounds, or if any cracks appear more than one inch long or open more than $^1/_{16}$ inch, or if the knuckle has opened more than ⅝ inch from the original position when pulled out against the lock. The measurement of the knuckle opening must be obtained after the pressure is released. The coupler shall be considered as having failed to stand this test if it slips apart from the dummy in the machine, or if the knuckle will not open, or if the locking device is inoperative after the test. Should the coupler fail to stand the prescribed test, but before failing, stand a pull of 100,000 pounds, another complete coupler shall be provided and tested as per Section 2 under "Inspection," governing retest.

In last line under test No. 1 and test No. 3, change "Section 8" to read "Section 2 under Inspection."

Recommended Change in Specifications for Separate Knuckles.—In Section 4, third sentence, reading "The holes for pivot pins . . . must not be more than $^1/_{16}$ inch larger than 1⅝ inch diameter pivot pin," change "$^1/_{16}$ inch" to "$^1/_{32}$ inch."

Section 6 to read as follows: "Each knuckle must bear the name of the coupler, a serial number and the manufacturer's name or identification mark, legibly stamped or cast at some point where it will not be subject to wear."

Recommended Changes in Specifications for Knuckle Pivot Pins.—Change first sentence of Section 3 to read as follows: "All pins must not be more than $1^{41}/_{64}$ inch or less than $1^{39}/_{64}$ inch in diameter, determined by a suitable gage, and must not vary more than ⅛ inch above or below the proper length."

Under "Physical Test," first sentence, replace word "weight" by words "standard weight of 1,640 pounds."

Automatic Coupler Attachments.

The text under recommended practice in the Proceedings gives no authority for the yokes shown on M. C. B. sheet "B." The committee suggests, therefore, that this matter be covered in the 1909 Proceedings. The yokes were adopted as Recommended Practice in 1904, upon the recommendation of the Draft Gear Committee. Reference to a modification in the yokes made in 1907, which now appear under "Brake Beams," should be changed and placed under "M. C. B. sheet B."

Friction Draft Gear.

The committee regrets that it is unable at this convention

to report on any definite investigation of the subject of draft gear performance. Broadly, the information desired is the proper resistance during the various stages of compression and the most desirable maximum capacity. A tentative discussion was given on this phase of the subject in the report of last year, as well as the results of a number of static tests, from which some useful information of a preliminary nature was derived. In order to procure definite information on the performance of existing gears, as well as information from

COUPLER SIDE CLEARANCE TESTS.

SUMMARY OF MAXIMUM SIDE PRESSURES AT END SILL. POUNDS.

Total Side Clearance.	Cresson Division. Sharpest Curve 13°00 Average Draw Bar Pull at Test Coupler 25033 Pounds.	Bellwood Division. Sharpest Curve 22°30 Average Draw Bar Pull at Test Coupler 32306 Pounds.	Monongahela Division. Sharpest Curve 16°00 Average Draw Bar Pull at Test Coupler 15286 Pounds.
One Inch	4800	7100	5200
Two Inches	2400	3000	2600
Three Inches	----	1600	——
Four Inches	0	----	----
Five Inches	0	----	——

---- INDICATES NO TESTS MADE.
0 " NO PRESSURES.

M.C.B. COUPLER REPORT 1909 SHEET Q

Coupler Side Clearance Tests.

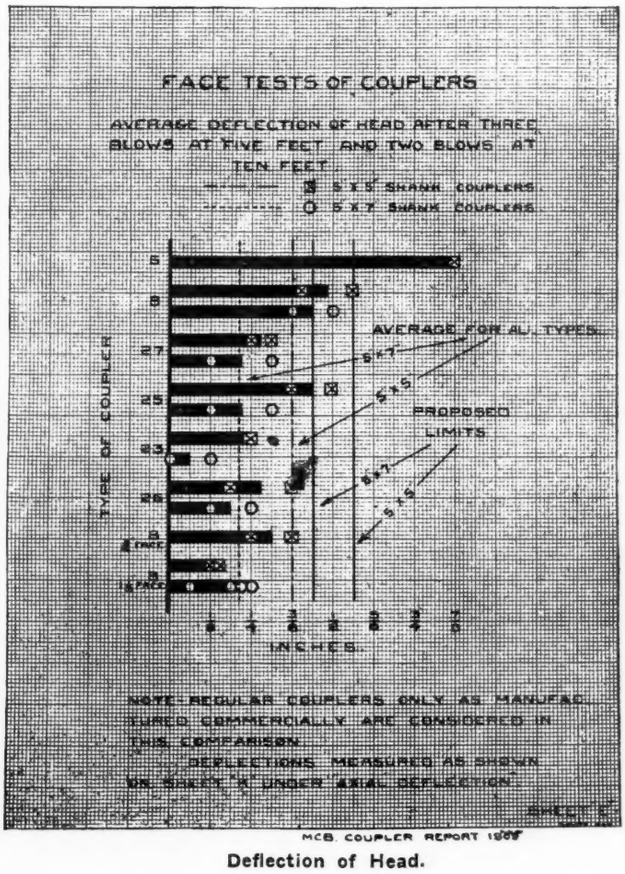
which to base future designs, it is believed that the following policy should be followed: First, the carrying out of a comprehensive series of service tests with accurate recording devices; and, second, the design of a laboratory testing arrangement which will subject the gears to approximately the same pressures and shocks received in service. With the above in view, a study of previous tests has been made, but although data of exceeding interest has been placed at the disposal of your committee, by both railway companies and manufacturing concerns, there is really little definite knowledge available.

An arrangement (shown on sheets Z-2 and Z-3) attached to a car coupler which recorded the position of the coupler, and hence the compression of the draft gear at any instant, was used in conjunction with the coupler side clearance tests referred to elsewhere in this report. Three types of gears were tested, two friction and one tandem spring. The average compression of those gears, and the drawbar pull is shown on sheets R-1, R-2, R-3, S and T [not reproduced herewith], giving the results of the coupler side clearance tests, but the compression at any instant resulting from changes in pressure could not be determined, as the dynamometer measuring the drawbar pull is not designed to instantaneously record sudden changes or shocks. It was obvious, however, that one of the friction gears, called type B in this and last year's report, was not sufficiently sensitive, after the capacity of the preliminary spring, 19,000 pounds, had been reached. This was apparently due to sticking of the wedges. The amount of compression did not change until the drawbar pull had varied considerably and when the wedges did finally slip there was a noticeable shock, which must, in the long run, be injurious to couplers and their attachments and possibly to the car framing. The tandem spring gear responded readily to changes in drawbar pull, but in these tests no shocks, such as are encountered in making up trains and in shifting operations, exceeding the capacity of the gear, were experienced. As mentioned in the report of last year, the good friction gears are undoubtedly an improvement in protecting equipment from constant severe shocks due to their greater capacity and to their ability to absorb the force of the blows instead of returning it to the cars in the form of recoil, as is done by the spring gears.

Coupler Side Clearance Tests.

Object.—The committee during the past year has conducted some very extensive coupler side clearance tests. The object of these tests was to determine the proper amount of lateral play for the coupler shank at the end sill on freight cars. It has been quite generally thought that couplers when curving exerted a very considerable side pressure on the end sill, and that this pressure was eventually transferred through the car framing and trucks to the wheel flanges. Some considered that this materially increased train resistance, while others thought that the pressure on the end sill was directed toward the inside rail and would, therefore, tend to pull the flanges away from the outer rail, thereby reducing flange wear and train resistance on curves.

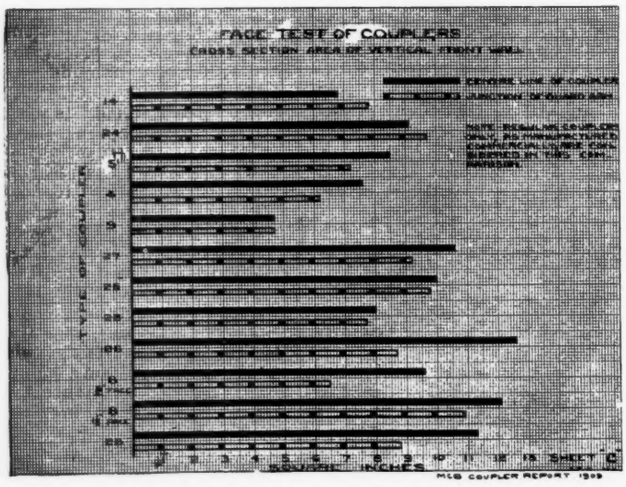
Description of Tests.—A 100,000 pound capacity steel underframe gondola car, of forty-four feet eleven inches coupled length, thirty-three feet between truck centers, was equipped with a diaphragm dynamometer for measuring the coupler side pressure at clearance ranging from ½ inch to 5 inches in one-half inch stages. The clearances referred to in this report are total clearances, i. e., by five-inch clearance is meant two and one-half inches on each side. A drawing of the dynamometer is shown on sheet Z-1 [not reproduced herewith], and the general arrangement of the auxiliary testing apparatus is shown on sheets Z-2 and Z-3. A description of the dynamometer, which has been but slightly modified, was given in the report of last year. The side pressures are transferred through a yoke, having plates to vary the amount of clearance, and a lever to the dynamometer. A very slight movement of the dynamometer diaphragm, which has an area of forty-two square inches, displaces the liquid which, by means of a small copper pipe, spreads the arms of a recording gage, of the Bourdon tube type. The capacity of the dynamometer is 50,000 pounds, and the recording gage pen has a movement of two and one-half inches corresponding to this pressure. The gage pen marks on paper driven by the wheels of the car, and the pressure at any instant is obtained by measuring the distance between the line made by the gage pen and the datum line made by a stationary pen. A sample diagram taken from one of the yard tests, is shown on sheet X. To facilitate working up the data the following information was also recorded on the traveling paper. Distance marks for each thousand feet, time every five minutes, locations such as mile posts, stations, point of curves, point of tangents and marks showing whether or not the coupler clearance was taken up. The pens giving the above information are actuated by electro magnets operated by observers conveniently stationed. The dynamometer was specially manufactured and furnished by William Sellers & Co., at a cost of $680. The recording gage was supplied by the Schaeffer & Budenberg Manufacturing Company for $105. These devices were purchased at the expense of the Association. An initial pressure of 1,000 pounds is permanently locked in the dynamometer to permit the pressures on both sides to be registered without lost motion, hence only pressures in excess of this amount are recorded. The yoke transferring the pressures from the coupler to the dynamometer is somewhat in front of the end sill, therefore, the actual pressures recorded are less than those to which the end sills


FACE TESTS OF COUPLERS
AVERAGE DEFLECTION OF HEAD AFTER THREE BLOWS AT FIVE FEET AND TWO BLOWS AT TEN FEET.
5 X 5 SHANK COUPLERS.
5 X 7 SHANK COUPLERS.
AVERAGE FOR ALL TYPES.
PROPOSED LIMITS
INCHES.
NOTE: REGULAR COUPLERS ONLY AS MANUFACTURED COMMERCIALLY ARE CONSIDERED IN THIS COMPARISON.
DEFLECTIONS MEASURED AS SHOWN ON SHEET X UNDER AXIAL DEFLECTION.
M.C.B. COUPLER REPORT 1909

Deflection of Head.

are subjected. The figures given in this report represent the correct end-sill pressures and are computed by adding twenty per cent. to each recorded pressure. The dynamometer was calibrated previous to the tests on a static testing machine and it was retested after the tests, and the readings were found to correspond with the original calibrations.

The test train consisted of dynamometer car for measuring the drawbar pull, and thirteen 100,000 pounds capacity steel underframe gondola cars of the same dimensions as the test



Cross Sectional Area of Front Wall.

car described above. Each gondola car was loaded with 110,000 pounds of scrap iron, making the total gross weight of the train, including the dynamometer car and side pressure test car, 1,084 tons, or an average of 77.4 tons per car. Each carrier iron on the gondola cars was equipped with sixteen ¼-inch plates for varying the coupler side clearance between one inch and five inches. The make-up of the train for each test is given on sheets R-1, R-2, R-3, S and T. The tests on the Bellwood division were made with eight cars only, due to the heavy ascending grade; the gross tonnage in this test was 612 tons. The dynamometer car measuring the drawbar pull was placed at the head of the train on the pulling tests and at the rear of the train on the pushing tests. The side clearance test car was placed third in the train with the test coupler forward on most of the tests, but other positions were tried.

The tests were conducted on portions of three different branch-line divisions of the Pennsylvania Railroad, and the length of the test runs, exclusive of the distance required to start and stop, was as follows: Cresson division 5.87 miles, Bellwood division three miles and Monongahela division nine miles. Reference to track charts on sheets U, V and W [not reproduced herewith], will show the frequency and degree of curves and the grades. In addition to the road tests, trials with the test car and one other, were conducted through a No. 8 switch and a No. 6 slip switch with only sixteen feet of tangent track intervening, and also on an industrial siding curve having a minimum radius of sixty-eight feet.

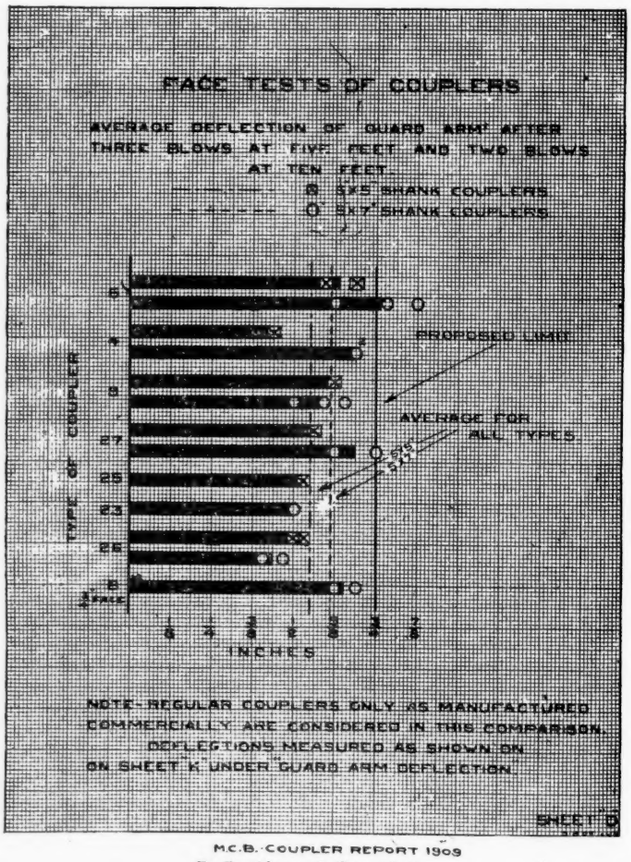
Result of Tests.—From sheets R-1, R-2 and R-3, giving the results of twenty-three tests on the Cresson division, it was found that the drawbar pull, or train reistance, varies very slightly, 28.22 pounds per ton being the maximum and 25.86 pounds per ton, the minimum, and from the following averages of all the tests on the division, it is seen that the train resistance is not affected by the coupler side clearance.

Comparison of average train resistance and coupler side clearance, Cresson division:

Side clearance.	Av. train resistance
1 in.	28,885 lbs.
2 "	28,992 "
4 "	28,525 "
5 "	29,303 "

It would be difficult to find a better location for tests of this character, as the curves are sharp and close together and are not compensated. There are only four places on the stretch of 5.87 miles where the entire train is on a tangent and in these cases it is only a few feet before the next curve is entered. The train resistance due to a thirteen-degree curve in addition to level tangent and grade resistance is about thirteen pounds per ton, therefore, if it were affected by variations in coupler side clearance, it would readily be detected on a division of this character. In order to eliminate any variations in train resistance, which might be attributed to changes in temperature between the different tests, the car journals were warmed by running the train nine miles at a speed of about fifteen miles an hour immediately before each test. The tests on the other two divisions, while not so numerous, checked the results obtained on the Cresson division, showing no variation in train resistance due to lateral coupler play.

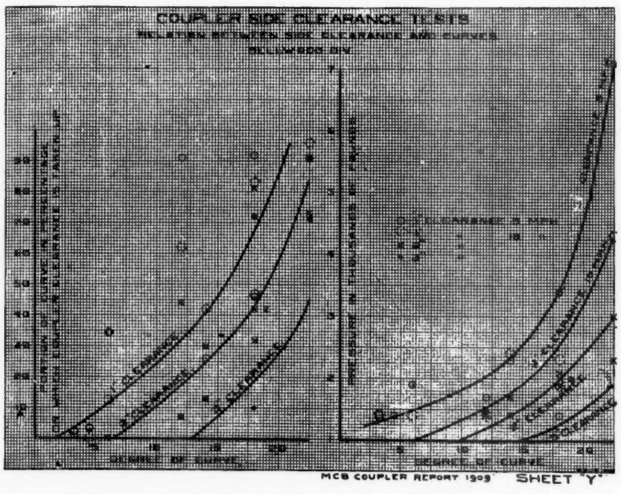
A summary of the maximum coupler side pressures with the corresponding amount of side clearance and the degree of curve on which they were obtained, is given on sheet Q. The pressures on each test are given on sheets R-1, R-2, R-3, S and T. The maximum pressure recorded on the unusual curve of 20 deg. 30 min. was, with one-inch clearance 7,100 pounds, two-inch clearance 3,000 pounds and three-inch clearance, which is standard to the car, 1,600 pounds. None of these could be considered injurious to the equipment, when the vast number of shocks and strains to which cars are almost continually subjected are considered. The recorded pressures on all the pulling tests were exerted toward the inner rail of the curve, but in so far as the observers could ascertain they did not have any effect tending to pull the wheel flanges away from the outside rail. The side pressures are, roughly, the resultant force formed by the drawbar pull and the angularity between the coupled cars on a curve. With the class of cars used in these tests, this angle is about seven degrees on a thirteen-degree curve, which gives a theoretical side pressure of about 3,000 pounds with a drawbar pull of 25,000 pounds. The actual side pressure is sometimes in excess of and often less than this amount, due to numerous variables, such as swinging of the cars and binding of the coupler knuckles. There are portions on sharp curves where a clearance as small as one inch is not taken up, due to the above-mentioned variables. The plots on sheet Y give approximately the relation between this phase of coupler clearance and the degree of the curves and also the relation between side pressure and degree of curve. The pressures obtained in the pushing tests shown on sheet R-3 were not as large as on the pulling tests, and apparently bore no fixed relation to the degree of the curves; in fact, slight pressures were recorded on tangent tracks due to the coupler contour lines allowing the heads to be pushed out of the direct alignment. Similar conditions were obtained on the drifting tests; in the latter trials, however, the slight pressures seemed mainly to be


FACE TESTS OF COUPLERS
AVERAGE DEFLECTION OF GUARD ARM AFTER THREE BLOWS AT FIVE FEET AND TWO BLOWS AT TEN FEET.
8 5½" SHANK COUPLERS
O 5x7" SHANK COUPLERS
PROPOSED LIMIT
AVERAGE FOR ALL TYPES
INCHES
NOTE- REGULAR COUPLERS ONLY AS MANUFACTURED COMMERCIALLY ARE CONSIDERED IN THIS COMPARISON. DEFLECTIONS MEASURED AS SHOWN ON ON SHEET K UNDER "GUARD ARM DEFLECTION."
SHEET O
M.C.B. COUPLER REPORT 1909

Deflection of Guard Arm.

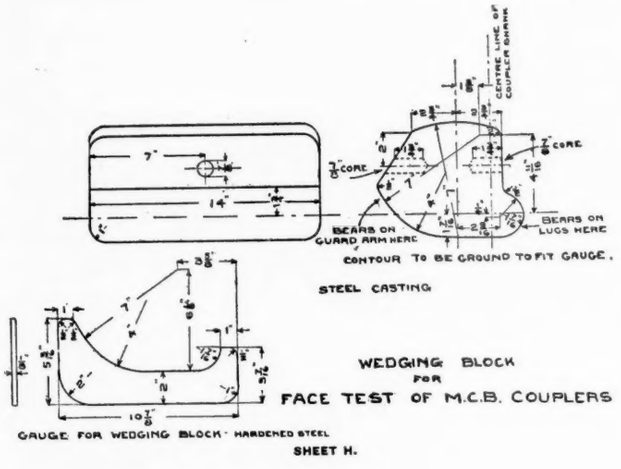
due to the swerving of the cars. It was thought that the length of the coupler yoke might affect the side pressures, therefore, one test, No. 42, shown on sheet S, was made with a long tandem spring yoke attached to the test coupler, but no difference in the lateral pressure was obtained. With this exception all of the cars were equipped with friction draft gears and their corresponding yokes. It must be kept in mind that all the results given in this report are based on one class of car, the side pressures on shorter cars would doubtless be somewhat less, varying with the overhang and distance between truck centers.

The yard tests with two loaded cars on a curve with a minimum radius of sixty-eight feet developed very excessive



Relation of Curves to Pressure.

side pressure even with five-inch side clearance; in fact, it was not practicable to push the cars all the way around the curve, as the pressures were in excess of the dynamometer capacity. These same tests with empty cars gave practically the same results, except that the wheels at the test-coupler end of car were lifted about one inch off the outer rail during the trial with one-inch clearance. The side pressure on these tests is principally due to severe cornering of the end sills. Service of this kind, however, may be considered abnormal


BEARS ON GUARD ARM HERE
BEARS ON LUGS HERE
CONTOUR TO BE GROUND TO FIT GAUGE.
STEEL CASTING
WEDGING BLOCK FOR FACE TEST OF M.C.B. COUPLERS
GAUGE FOR WEDGING BLOCK - HARDENED STEEL
SHEET H.

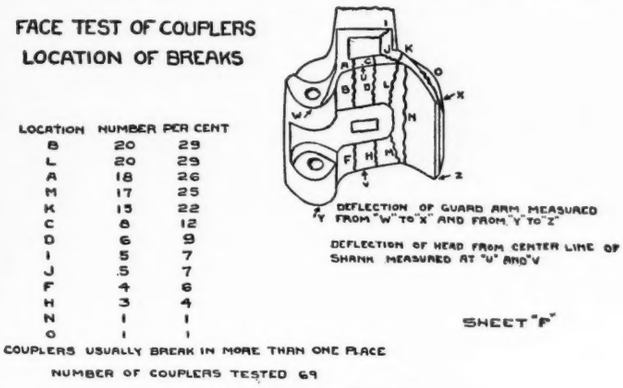
Wedging Block.

and would require a total lateral coupler play on reverse curves of thirty-eight or forty inches, which would make necessary excessive and expensive changes in car construction, and more or less elaborate centering devices. The committee does not consider that curves of this character are encountered often enough to make these changes advisable, and can only suggest that auxiliary couplers, or some other method of handling the cars, be adopted under these conditions. A side pressure of 12,000 pounds was obtained with one-inch clearance in pushing the test train through a No. 6 slip switch followed by a No. 8 switch with sixteen feet of tangent track intervening. The following results were obtained by running two loaded cars through these same switches; one-inch clearance, 4,800 pounds; two-inch clearance, 2,200 pounds; three-inch clearance, 1,400 pounds.

Conclusions.—In concluding the portion of the report relative to coupler side clearance, the committee would like to make special mention of the following deductions, drawn from the results of the tests: First, train resistance and, therefore, the amount of tonnage hauled under general road conditions is not influenced by coupler side clearance; second, the side pressures exerted on the end sills of cars by the couplers are not excessive with two and one-half inch clearance on any road or on any normal yard curves, and, third, it is recommended that the present standard side clearance of "Not less than 2½ inches," be changed to read simply "2½ inches," as this is ample and there is a liability of couplers not mating if more clearance is allowed without centering devices.

SUMMARY.

A summary of the recommendations which the committee offers to be submitted to letter ballot to be adopted either as


FACE TEST OF COUPLERS
LOCATION OF BREAKS
LOCATION NUMBER PER CENT
B 20 29
L 20 29
A 18 26
M 17 25
K 15 22
C 8 12
D 6 9
I 5 7
J 5 7
F 4 6
H 3 4
N 1 1
O 1 1
COUPLERS USUALLY BREAK IN MORE THAN ONE PLACE
NUMBER OF COUPLERS TESTED 69
DEFLECTION OF GUARD ARM MEASURED FROM "W" TO "X" AND FROM "Y" TO "Z"
DEFLECTION OF HEAD FROM CENTER LINE OF SHANK MEASURED AT "U" AND "V"
SHEET 'F'

Location of Breaks.

Standard or Recommended Practice is as follows. (The detailed wording covering the recommended changes in the specifications is given above):

Standards.

Specifications for M. C. B. Automatic Couplers:

1. That the guard-arm test be abolished and the face test substituted in its place, two couplers to be so tested.
2. That one coupler instead of two be submitted to the pulling test.
3. That the holes for knuckle-pivot pins must not be more than $^{1}/_{32}$ instead of $^{1}/_{16}$ inch, larger than 1⅝-inch diameter pivot pin.
4. That six knuckle pivot pins be tested in accordance with the specifications for knuckle pivot pins for every one thousand couplers purchased.
5. That the gages shown on sheet N be adopted as Standard of the Association, and that Section 6 and Section 1 under "Inspection," be modified to require their use.

Specifications for Separate Knuckles.

6. That the holes for knuckle pivot pins must not be more than $^{1}/_{32}$ instead of $^{1}/_{16}$ inch, larger than 1⅝-inch diameter pivot pin.
7. That each knuckle must bear the name of the coupler legibly stamped or cast at some point where it will not be subject to wear.

Specifications for Knuckle Pivot Pins.

8. That these specifications be adopted as a Standard of the Association.
9. That all pins must not be more than $1^{41}/_{64}$ inch or less than $1^{39}/_{64}$ inch in diameter, determined by a suitable gage.
10. That word "weight" be replaced by words "standard weight of 1,640 pounds," in first sentence under "Physical Test."

Drawings:

11. That sheet M. C. B.-11 be changed to conform to sheet "O" accompanying the report.
12. That the present standard coupler side clearance of "Not less than 2½ inches" be changed to "2½ inches."

Recommended Practice.

1. That sheet M. C. B. "B" be changed to conform to sheet "P" accompanying the report.

REVISION OF THE RULES OF INTERCHANGE.*

RULE 3, PAGE 3.—Restore the words, "send bill on this card to ....," which were omitted in 1908.

Add the following: "The end of car toward which the cylinder push rod travels shall be known as the 'B' end and the opposite end as the 'A' end."

RULE 3, PAGE 4.—Change the word "may" in the fifth line to "must," to overcome the abuse of the repair and defect card.

RULE 10, PAGE 5.—Change to conform with the leaflet sent out by the Arbitration Committee September 22, 1908, making the rule read:

"Worn flange: cast wheels under cars of less than 80,000 lbs. capacity, with flanges having flat vertical surfaces extending more than 1 in. from tread, or flange $\frac{15}{16}$ in. thick or less, gaged at a point $\frac{3}{8}$ in. above tread. Wheels under cars of 80,000 lbs. capacity or over, with flanges having flat vertical surfaces extending more than $\frac{7}{8}$ in. from tread, or flange less than 1 in. thick, gaged at a point $\frac{3}{8}$ in. above tread (see Figs. 4 and 4a).

"Worn flange: steel and steel-tired wheels with flanges having flat vertical surfaces extending more than 1 in. from tread, or flange $\frac{15}{16}$ in. thick or less (see Figs. 4 and 4a)."

Modify the drawing of wheel defect gage (Fig. 1, page 7) by the insertion of the dimensions $\frac{3}{8}$ in. to show the exact point of contact of gage against the throat of worn flange when used in the position shown in Fig. 4, page 10.

RULE 11, PAGE 6.—Change the $1\frac{1}{32}$ in. in fourth line to $1^{19}/_{64}$ in.

RULE 17, PAGE 7.—Change to "Wheels cast prior to the M. C. B. Standard tread and flange adopted in 1907, and (Fig. 6a) for wheels cast after January 1, 1908."

RULE 20, PAGE 8.—Change the dimensions $1\frac{1}{32}$ in Fig. 2a, page 9, to $^{19}/_{64}$ in., to harmonize with the Standards of the Association.

RULE 21, PAGE 10.—This rule refers to Figs. 2 and 2-A, the Fig. 2 representing the maximum flange thickness gage for wheels cast prior to the M. C. B. Standard Tread and Flange adopted in 1907, and the Fig. 2-A representing the maximum flange thickness gage for wheels cast after January 1, 1908, but the rule does not so state, the rule to read:

"The determination of flat spots, worn flanges and chipped treads shall be made by gage, as shown in Fig. 1.

"The determination of thick flanges for all wheels cast prior to the M. C. B. Standard Tread and Flange adopted in 1907 shall be made by a gage shown as Fig. 2, and for all wheels cast after January 1, 1908, shall be made by a gage shown as Fig. 2-A."

RULE 22, PAGE 15.—The committee would propose that the words "or pitted" be eliminated from this rule.

RULE 23, PAGE 15.—The Arbitration Committee called the attention of the Committee on Revision of Standards to a discrepancy between the measurements of the wheel test of axle B shown on Sheet M. C. B. 7 and the condemning limits shown in this rule. In 1901 a size of $5\frac{3}{4}$ in. was adopted as standard. Allowing $\frac{1}{4}$ in. to be turned off would bring the limiting size down to $5\frac{1}{2}$ in., whereas the condemning limit in the rule is 5 in. This matter was considered by the Committee on Standards, and it recommends the appointment of a special committee to recommend changes in the axle limits.

RULE 33, PAGE 17.—Change to read:

"Cars equipped with air-brake hose other than M. C. B. Standard, on and after June 1, 1909, except $1\frac{1}{4}$ in. M. C. B. Standard hose, and so branded, which hose has been manufactured previous to June 1, 1909 (owners responsible), except cars offered in interchange, when delivering company is responsible."

RULE 41, PAGE 18.—Change to conform with decision of American Railway Association as to size of advertising matter permitted on freight equipment.

Change last sentence to read as follows:

"The size and character of cards which may be used on freight cars may be divided into four classes, viz.:

"1. Routing Cards: Cards bearing information required by the railways, such as initial and number of cars, consignee, destination, consignor, contents, point of shipment, route, etc.

"To be of cardboard, size, vertical dimension maximum 5 in., horizontal dimension maximum 8 in.

"To be permitted on all loaded cars.

"No picture or trade-mark to be permitted.

"Space for railway information to occupy lower three-fifths of card.

"Any printing on the upper two-fifths to be limited to letters not exceeding one-half inch in any dimension.

"All printing to be in black ink.

"A copy of card, in reduced form, is shown herewith.

"2. Special Cards: Required by the Regulations for the Transportation of Explosives formulated by the Interstate Commerce Commission and the Regulations for the Transportation of Inflammable Articles and Acids prescribed by the American Railway Association. They shall be used, be of the text and size described, and be attached to cars as prescribed by said regulations.

"3. Symbol (e. g., fast freight line, manifest freight, etc.), and various M. C. B. cards: Cards prescribed by individual roads for special purposes. Their size, use, test and method of application will be prescribed by each individual road to suit its requirements.

"4. Special cards: Cards required by United States Customs Regulations or by State authorities, such, for example, as quarantine regulations, and must be used as prescribed by the United States Customs Regulations."

(Name of Consignor, etc.)

(Name of Consignor, etc., in letters not more than one-half inch in any dimension.)

.....

Initial and No...... **Contents**.....

Point of Shipment..... **R. R.**

Consignee and Destination.....

Via.....

Date.....

RULE 44, PAGE 19.—The committee would recommend to the Executive Committee that the scope of the Brake Shoe Committee be enlarged to conduct tests of brake beams and to report to the Association at each successive meeting the beams tested since its last report and beams are accepted as Class 1 or Class 2 beams and which are unacceptable for either classification.

RULE 48, PAGE 19.—Change the word "shall" in next to last line to "must."

RULE 56, PAGE 20.—Substitute the word "renewal" for "replacement."

Change the first note under this head to read:

"The word coupler in the above rules, 49 to 53, inclusive, means the coupler body only."

Another note should be added, to the effect that in Rules 49, 51 and 53 a combined front and back coupler stop for single spring will not enter into the combination.

RULE 59, PAGE 21.—Change the word "damaged" in the first line to "defective."

RULE 63, PAGE 23.—Add to the second paragraph:

"Where it is necessary to remove a load to make repairs to parts as specified in Rule 106 it must be plainly stated on repair card and stub."

The attention of the committee having been called to the matter of composite journal bearings, and there being apparently an opportunity for economies in their use, it is suggested that the Executive Committee appoint a special committee to investigate the different types of composite journal bearings and report to the next convention.

RULE 65, PAGE 25.—Add to second paragraph: "The thickness of each splice must not be less than the thickness of the web of the section spliced."

The committee would recommend that a committee be appointed to look into and report at the next convention on the maximum amount of splicing of sills allowable and the location thereof.

RULE 66, PAGE 29.—The Committee on Cast-Iron Wheels suggests the following in reference to mounting new cast-iron wheels, to provide proper clearance when passing through track frogs and at guard rails having $1\frac{3}{4}$ in. width of flange way:

"Mechanical difficulties in the manufacture of cast-iron wheels require a variation of $\frac{1}{16}$ in. in thickness, over or under the normal size for flanges, and as this is permitted under the M. C. B. Rules, it was requested at a joint conference of your committee with the committee representing the American Engineering and Maintenance of Way Association that a similar amount of latitude in reference to track construction be recognized, and, after a thorough discussion of the subject from all standpoints it was agreed to recommend to the Master Car Builders' Association that a rule be formulated prohibiting the mounting of two wheels having maximum thick flanges on the same axle; therefore we propose that the Master Car

*Abstract of a report presented at the annual convention of the Master Car Builders' Association, by J. W. Taylor, for the Arbitration Committee.

Builders' Association adopt the following as a standard rule governing interchange of traffic:

"RULE 66-A."

"In no case may two new wheels having maximum thick flanges be mounted on the same axle."

Before final action is taken on this suggestion, the Arbitration Committee will confer further with the Committee on Cast-Iron Wheels, and submit recommendation to the convention.

RULE 71, PAGE 30.—Cut out the last paragraph and change first paragraph to read:

"In replacing air-brake hose on foreign cars for which bills are made, new 'M. C. B. Standard' hose 'and so labeled' must be used."

RULE 72, PAGE 30.—Add after the words "restencil the car," in the sixth line, "which must be clean before reweighing." Also add after the word "charge," in the sixth line, the words "in accordance with Rule 106."

RULE 73, PAGE 31.—Add the following: "If the car is shopped for repairs for which the handling line is responsible. If the repairs are made on authority of car owner, or on authority of defect card, then the expense of reweighing and restenciling should be included in bill for the repairs."

RULE 76, PAGE 31.—Change the word "shall" to "must" in the second, seventh and twenty-fourth lines.

Omit reference to brake shaft for designing "A" or "B" end of car.

The subject of the abuse, or rather non-application, of the repair card has been discussed very thoroughly during the past year. A further discussion of the question at this convention would no doubt bring out points which would have a tendency to a stricter enforcement of the rules.

In regard to the form of the repair card referred to in Rules 76 and 77, a special committee was appointed to consider this subject, and its report has been seen by the Arbitration Committee. It is necessary to reproduce the recommendations of that committee in this report, inasmuch as its report will be presented to the convention, but the Arbitration Committee would heartily indorse the recommendations of that committee.

RULE 85, PAGE 35.—Change the reading to conform with the recommendations in Rule 3.

RULE 87, PAGE 38.—Change rule to read: "Bills may be rendered against car owners for the labor only of replacing couplers when lost on the line of the company making the repairs, including yokes, springs and followers when they have been lost with the coupler; also labor only for brake beams, including the attachments, such as shoes, heads, key bolts, brake pins, jaws and hangers when lost with the beam; also labor only for brake levers, lever guides, top and bottom brake rods when they have been lost on the line of the company making repairs, whether lost with the beam or not."

RULE 88, PAGE 38.—Change to read: "In making bills under these rules, the information necessary should be embodied on the following forms, whether the same is made as a bill or a statement to accompany a bill."

Omit the column headed "Shop marks on wheels and axles."

RULE 89, PAGE 41.—The committee recommends the appointment of a special committee to report next year regarding the substitution of average credit price for wheel based on the number of wheels withdrawn from cars and scrapped; also in regard to charging cost of turning and loss of service metal on both wheels, though only one steel wheel or tire be defective.

RULE 94, PAGE 89.—Change to read:

Angle-cock handle, plain	.08	.08
Angle-cock handle, self-locking	.30	.30

And in regard to charges and credits for journal bearings:

Journal bearings, brass or bronze, lined or unlined, per pound, applied, charge, 18 cents, credit 13 cents.

Journal bearings, filled brass or bronze shell, per pound, applied, charge 14 cents, credit 10 cents.

RULE 106, PAGE 48.—Make the following changes, additions, etc.:

Changes.

Draft timber, one, *extending beyond body bolster*, renewed	.10	.10
Draft timber, two, *extending beyond body bolster*, renewed	.13	.14
Weighing and restenciling stock cars	50 cents net.	
Weighing and restenciling other cars	30 cents net.	

Additions.

Add a note after the words "Coupler with pocket attachments," reading:

"This does not include coupler stops riveted, which should be charged for on a per rivet basis in addition to the cost of removing and replacing coupler when this is necessary to do the riveting."

Posts and Braces.

	Cars—Ordinary.	Cars—Refrgatr
Braces, side or end, one, renewed	3 hrs.	6 hrs.
Braces, side or end, each, renewed, when associated with the renewal of posts	1½ hrs.	3 "
Posts, corner, door end or side, each, renewed, on empty car	3 hrs.	6 "
Posts, corner, door, end or side, each, renewed, when associated with renewal of side or end plates	2 "	3½ hrs.
Posts, corner, door, end or side, one, renewed on loaded car	4 "	6 hrs.

Eliminate the following:

Eliminations.

Draft timber bolts, complete, at one end of car, replacing	3 hrs.	3 hrs.
Draft timber bolts when same do not pass through upper center plate, three or less	2 "	2 "
Draft timber bolts when same do not pass through upper center plate, four or more	3 "	3 "
Draft timber bolts when one or more of the bolts pass through the center plate, add	3 "	3 "
Draft timber bolts, four or more at one end of car, replacing.	3 "	3 "

and substitute therefor the following note:

"If center-plate bolt or bolts pass through draft timbers it must be termed center-plate bolt and charged 3 hours."

Under the head of "Repair of Steel or Steel Parts of Composite Cars" make an additional note as follows:

"Coupler stops riveted should be charged for on a per rivet basis in addition to the cost of removing and replacing coupler when this is necessary to do the riveting."

RULE 107, PAGE 55.—Add after the word "knuckle" the words "knuckle lock."

Add after the words "brake-shoe keys" in fourth line, the words "side and end doors."

RULE 112, PAGE 56.—Change first item, page 61, as follows:

Retaining valve repaired	.25
Retaining-valve handle, R. & R.	.02
" case, R. & R.	.01
" ground in	.05
" cock key, ground in	.15
" cock key, and spring, R. & R.	.02
	.25

Increase the price for repairing retaining valve from 10 cents to 25 cents.

Add after the words "cylinder cleaned, oiled, tested and stenciled 33 cents," the words, "including obliterating old stencil marks."

Increase the cost of repairing retaining valve to 25 cents, and add the following details:

Retaining-valve handle, R. & R.	.02
" case, R. & R.	.01
" ground in	.05
" cock key, ground in	.15
" cock key, and spring, R. & R.	.02
	.25

RULE 113, PAGE 62.—There should be some definition as to the strength of the various forms of underframing, which should be investigated from all angles by a special committee, and it is suggested that such committee be named.

PASSENGER CAR RULES.

RULE 3c.—Change to read as follows:

"Line expenses shall consist of the expense of terminal cleaning, icing, lubrication (oil, waste, tallow and labor), lighting (oil, wicks, chimneys, burners, shades, gas and candles), heating (terminal heating and coal furnished for individual car heaters en route), and broken glass."

RULE 10c.—Change the charge for car heating from 15 to 25 cents per day per car.

RULE 14.—The committee concurs in the following suggestions from the Committee on Cast-Iron Wheels:

"Your committee has prepared and presents drawing D-4997, covering limits of wear for steel and steel-tired wheels under both passenger and freight cars, and recommends that same be adopted as Recommended Practice governing the service operation of such wheels under both passenger and freight cars, and that the cuts now appearing on M. C. B. Sheet "A" of Recommended Practice and pages 529 and 530 of the 1908 Proceedings, and 95, 96 and 97 of the Code of Interchange Rules be canceled, and the four cuts reduced from drawing D-4997 substituted therefor.

"Location of limit of wear groove to be ¼ in. below the tread face on steel and steel-tired car wheels, when same have worn to condemning limit of wear, as shown by Figs. 1, 2, 3 and 4, drawing D-4997. The shape of the groove to be as shown on these figures and measurements to be taken from the horizontal or inside edge of same.

"Existing M. C. B. Rules in Code of Interchange and referring to passenger cars require a removal of steel and steel-tired wheels 'for worn flanges' when such flanges are greater in section than is prescribed for steel and steel-tired wheels when used under freight cars. Wheel loads under passenger cars will vary from 12,000 to 14.000 lbs. and wheel loads under 80,000 lbs. capacity cars in freight service can, under M. C. B. Rules, be increased to 16,000 lbs. and over; therefore your committee proposes that rules relating to worn flanges for passenger cars using cast-iron and steel and steel-tired wheels be revised as follows:

RULE 14 (c).

"Worn Flanges: Flanges having flat vertical surfaces extending more than ⅞ in. from tread, or flange less than 1 in thick, gaged at a point ⅜ in. above tread.

"Gage: For condemning worn flanges of cast-iron wheels under passenger cars to be the same as is used for condemning

worn flanges of cast-iron wheels under freight cars of 80,000 lbs. capacity or over."

RULE 15 (b).—The following suggestion from the Committee on Cast-Iron Wheels is approved:

"Worn flange or tire with flange less than $\frac{15}{16}$ in. thick, or having flat vertical faces extending more than 1 in. from tread, or with tire thinner than is shown by Figs. 1, 2, 3 and 4 (Drawing D-4997).

"Gage: For condemning worn flanges of steel and steel-tired wheels under passenger cars to be the same as is used for condemning worn flanges of steel and steel-tired wheels under freight cars."

List of Prices.

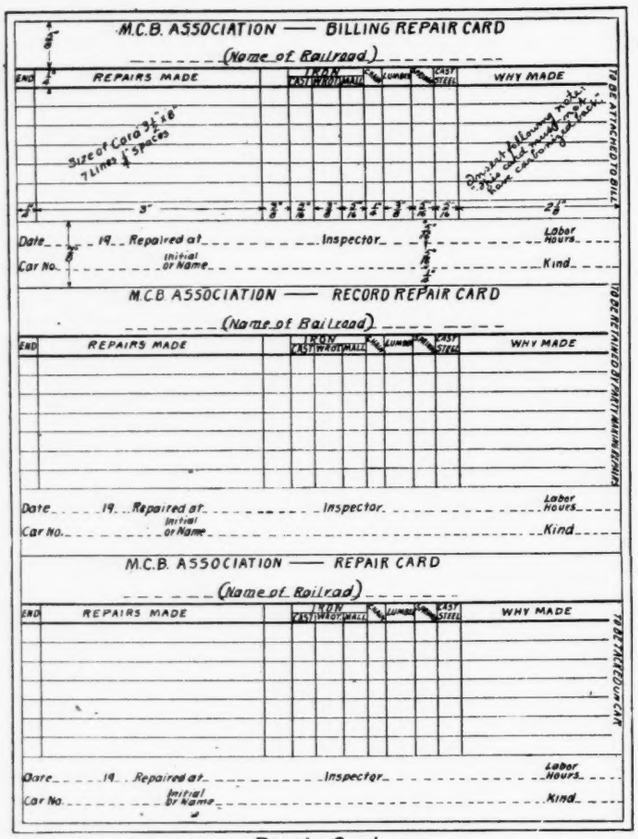
Make the credit for scrap journal bearings removed from passenger cars the same as for freight cars in Rule 94.

Change the price for "setting glass, per light" from 25 cents to 30 cents, to conform with recommendation of Arbitration Committee in circular of October 1, 1907.

REVISION OF THE M. C. B. REPAIR CARD AND QUESTION OF SETTLING CAR REPAIR BILLS ON A MILEAGE BASIS.*

The committee submits the following recommendations:

On account of a desire to have a card that can be made in triplicate and that will contain additional information to facilitate the making of bills, a great many roads have got



Repair Card.

away from the standard form of M. C. B. Repair Card. After considering the various cards in use, it is believed the form provided herewith will answer the requirements and should be used by all railways.

The principal changes in the repair card are in providing a form that can be made out in triplicate, in one writing if desired, by using carbon sheets instead of having to fill out two stubs and repair card separately; also providing columns to show weights and miscellaneous charges for different items of material to facilitate the making and checking of bills.

The proposed Repair Card consists of a Billing Repair Card, to be attached to bill, Record Repair Card, to be retained by party making repairs, and a Repair Card, to be tacked on car.

The Repair Card to be tacked on car shall be printed on cardboard, on both sides, with black ink, and shall be filled in on both sides, one side to be filled in with ink or indelible pencil.

The Billing Repair Card shall show the same information as on Repair Card and be attached to bill as authority for charge, and must not have carbonized back.

The Record Repair Card shall be retained by party making repairs.

The use of above cards will be effective June 1, 1910, and shall be as per forms attached.

Rule 58: Next to last line omit "and stubs."

Rule 63: First paragraph, next to last line, omit "and stubs" and add "s" to "card"; also, in second paragraph, first line, omit "and stubs."

Rule 76: In first paragraph eliminate last sentence reading as follows: "The card shall be provided with a stub, which will duplicate information on the card, and stubs must be forwarded with the bill." The second paragraph should be changed to read as follows: "If no bill is to be rendered the Billing Repair Card must be forwarded on or before the twentieth day of each month with the words 'no bill' written across the face of same. In case it is not the intention to render bill the words 'no bill' shall also be written across the face of the Repair Card."

Rule 77: Change rule to read as follows: "The Repair Card shall be 3½ by 8 inches, made in triplicate, to be known as Repair Card, Billing Repair Card and Record Repair Card. The Repair Card to be tacked on car shall be of cardboard, printed on both sides in black ink, and shall be filled in on both sides, one side to be filled in with ink or black indelible pencil. The Billing Repair Card shall show same information as on Repair Card and shall be attached to bill as authority for charge. The Record Repair Card shall be retained by party making repairs."

Rule 80: In next to last line add word "billing" before word "repair" and omit word "stub."

Rule 81: In second line omit the word "stub" and substitute the words "Billing Repair Card."

Rule 98: In third paragraph, second line, add word "billing" before word "repair" and omit word "stubs."

The committee also recommends the following addition to Rule 88 providing a special repair card, if desired, for changes in wheels and axles: "In exchanging wheels and axles under foreign cars reports on repair card, of M. C. B. standard size, embodying all information required by the following statement will be acceptable."

It is further recommended that the reporting of shop marks be discontinued, as this information does not appear to be necessary for the proper record of wheels and axles, and that the form of wheel bill shown on page 39 of the Rules of Interchange be changed by the omission of this column.

Concerning the suggestion of making repair bills on a mileage basis, the committee does not consider such a plan feasible.

Any such arrangement would have to be based on average conditions and the committee does not feel that the cost of maintaining cars in the various sections of the country is sufficiently alike at the present time to warrant us in assuming that such a basis would be an equitable one.

While the operation of the present rules calls for a large expense from a clerical standpoint, the making of bills on M. C. B. defect cards, destroyed cars, and charges for owners defects, would still have to be carried on if the proposed plan were adopted, and the possible saving would be offset by the additional cost of inspection, loss to car owners account of deterioration of their equipment on foreign lines and additional clerical help that would be necessary to adjust discrepancies, which would, no doubt, develop under proposed system.

SAFETY APPLIANCES.*

This committee, by construction, confines its work to those standards formerly designated "for the protection of trainmen." Safety appliances are generally considered to include the fixtures on cars which are referred to in the Safety Appliance Acts, so called, and embrace air brakes, coupler and unlocking attachments in addition to handholds, steps, etc. Two other standing committees have these matters in hand, so that this committee has no supervision over all that its title would imply. This is not generally understood, as was proven by the receipt of several communications from members in reference to matters outside of our supervision.

The committee reports very few answers to its circular of inquiry sent out September 10, 1908. The cordial support of

*Report presented at the annual convention of the Master Car Builders' Association. Committee: J. F. Deems (chairman), D. F. Crawford, F. H. Clark, J. G. Neuffer.

*Abstract of a report presented at the annual convention of the Master Car Builders' Association. Committee: C. A. Seley (chairman), A. LaMar, T. H. Curtis, C. B. Young, Le Grand Parish, H. Bartlett, T. M. Ramsdell.

the committee's report indicated a belief that the revision had not departed from the spirit and intent of the old standards, but that they had been clarified as to language and expression and extended on proper lines to cover the developments in car types and construction not existing when the standards were first promulgated. The practically unanimous ballot also proves the wisdom shown by those originating and building up these standards.

A significant indication of the status of the M. C. B. Standards is shown in an executive order issued by the President of the United States on January 6, 1909, extending to the Canal Zone and the railways in navy yards, docks and government property, requiring that the various appliances for the protection of trainmen, as designated in existing Standards of the Master Car Builders' Association, be used on all freight cars in above described territory. The date of this order was subsequent to that of the letter ballot, so that the standards referred to are the present standards.

5. Our Standards have always permitted substitution for handholds, extending their function to the coupler unlocking rod, lower rounds of ladders, brake-step brackets, etc. The opinion of the Association in this respect has been sustained in a recent United States Court proceeding. Judge Dodge, in the District Court of Massachusetts, in the case of the United States vs. Boston & Maine Railroad.

It was the Master Car Builders' Association that originally affirmed these substitutions as early as 1896, and by almost unanimous letter ballot extended the principle of substitution to apply to the platform posts and railing of open platform passenger train cars and cabooses as effective handholds in 1908. The application of handholds to such platform cars is certainly not in accord with M. C. B. Standards; practical trainmen do not want them, and it is difficult to understand why some roads are applying them, unless to fulfill a strictly technical interpretation of the law, which is contrary to the opinion held by Judge Dodge.

Several members have written this committee regarding the use of the coupler unlocking rod as an effective handhold. With proper clearance, it is just as much of an M. C. B. Standard as any which are included under that title and should be so held until the courts require otherwise.

9. Several members urge the abolition of lag screws as fasteners for handholds and steps. The committee cannot approve the suggestion. A lag screw properly applied is undoubtedly a secure fastening. Many roads are discontinuing the use of lag screws and in repairs are replacing them with bolts with nuts outside wherever practicable. There are, however, some locations that a bolt for fastener is almost prohibitive on account of construction details, and if the Standards required bolts "wherever practicable," a question would frequently be raised as to the practicability, whereas the true question is as to whether the lag screw was properly applied. There is nothing to prevent roads making the change on their own cars from lag screw securing to bolt securing for safety appliances.

In answer to a circular of inquiry asking for suggestions as to revision, the following communications have been received and considered:

"We notice on M. C. B. Sheets 19-E, 19-F, 19-G, 19-H and 19-I, in the M. C. B. Circular relating to Letter Ballot, in the sixth paragraph of the notes, the reference is made that wooden treads are to be 1½ by 2 inches, hard wood. I think this should be cut out, as there are no ladders used on low-sided gondolas, or on the high-sided gondolas as shown on 19-I."

The committee approves this suggestion and would also include Sheet M. C. B.-J in above list. It recommends that this be referred to letter ballot.

"This committee should urge the railways that have cars equipped with handholds in positions other than those specified to have such handholds removed from the cars. A number of roads have applied handholds according to standard practice, but also allow handholds that were originally on the car to remain, regardless of the application of the new ones."

No action is necessary on this recommendation, but it is approved by the committee.

"Running boards should be 24 inches wide.

"Would recommend that roof grabirons be placed diagonally at corners with ends fastened to side and end fascia for cars with metal outside roofs, be shown on Sheet 19 or described in rules. Bolts do not pass through roofing.

"Gondolas, flats and all other cars having grabirons on end sills, should have them secured to face of sill or under sill, the former being a better location for a safety appliance in every way, and objection has been raised in regard to having same applied under sill by the Railroads and Warehouse Commission of Illinois, et al. We place all of our grabirons on face of sill on new equipment, and in making renewals.

"On page 585, Proceedings of 1907, you will find the following: 'It is also recommended that all grabirons or handholds applied on wood shall be secured by through bolts ½ inch in diameter with nuts on the outside and riveted over wherever it is possible.' Same can be better expressed by saying 'wherever it is practicable.'"

The committee does not approve above recommendation on width of running boards. The Standard names a minimum of 18 inches, but does not discourage the use of greater width.

The diagonal roof handhold is contrary to M. C. B. Standards, which require roof handhold to indicate by its position whether ladder is on side or end of car.

It does not approve forbidding the use of under side of end sills for attachment of handholds, as on many cars there is no place to make the attachment on the face of the sill.

It does not approve changing the word "possible" to "practicable" with reference to bolt fastenings, believing the difference in the language is not vital.

Another member makes several suggestions, all applying to new cars, overlooking the fact that these standards apply to all cars and all changes are retroactive.

24. Another member makes a number of suggestions as follows: "Revise Paragraph 2, under Ladders, with reference to high-side gondolas, to read as follows:

"'High-side gondola cars with fixed ends having brake-staff platform at one end of car *may* have ladders and sill steps on both sides at same end of car, provided this arrangement does not conflict with the rule regarding sill steps and handholds at diagonal corners of cars.'"

The committee approves this suggestion, and recommends that it be referred to letter ballot.

This member thinks there should be direct references to fastenings of ladders and handholds in the sections under each heading.

The committee believes this to be an unnecessary repetition, and that all fastenings are properly covered in the section on Fastenings. It believes, however, that the word "Steps" should be added to the title of the Fastenings section, making it read "Steps, Handholds and Ladder Tread Fastenings," and recommends that this be referred to letter ballot.

It is also suggested to revise Paragraph 5 under heading Passenger Train Cars, regarding steps, to read as follows:

"Passenger train cars not equipped with platforms, also cars with projecting end sills, to have a metal sill step at each corner with tread not higher than 32 inches from the rail."

The committee approves this suggestion, as more clearly defining the car design referred to, and recommends that it be referred to letter ballot.

It is also suggested that passenger train car fastenings for handholds, hand railings, steps, etc., be more definitely stated.

The committee believes that, due to the fact that passenger train cars are of an entirely different type of construction from freight cars; that they are under more constant and exact inspection; that they are regularly shopped as a rule; and that due diligence is exercised by railways generally in regard to safety, convenience and comfort of passengers who mainly use these appliances, so that the Passenger Train Car Standards in this respect are sufficiently covered.

It is also suggested that on all plates where the fastenings for sill steps or ladder treads are merely stated "with bolts, rivets or lag screws" that this be changed to read more exactly and as follows:

"Fastenings not smaller than one-half inch bolts with nuts outside when possible and riveted over; or, one-half inch lag screws, 3 inches long, screwed full length into the wood; or one-half inch rivets."

The above change applies to all Sheets, M. C. B. 19-A to 19-P, inclusive, as to fastenings for steps, and to 19-B, D, J and P as to ladders, and recommends that it be referred to letter ballot.

This member also writes regarding M. C. B. Sheet 19-L:

"Cut shows a fixed-end gondola car with high sides and ends, and without projecting end sills.

"Believe cut should be changed to show projecting end sills, for the reason should a person try to mount sill step, catching hold of the vertical handhold first, the chances are his weight would carry him around the end of the car, as he has no projecting end sill on which to place his foot after he has mounted the car."

The committee does not entirely agree with this suggestion, inasmuch as there are cars of this type both with and without projecting end sills, but would approve adding, within the brackets under the caption, "with or without projecting end sills," and add projecting end sills to the drawing in dotted lines. This does not affect the appliances concerned. It is recommended that this be referred to letter ballot.

It is further suggested to add to Sheet M. C. B. 19-J the following:

"Car may have ladders and sill steps on both sides at same

end of car (with arrow pointing to brake shaft end of car)."

The committee approves this suggestion, provided the reading is made consistent with that proposed in Paragraph 24, and recommends that it be referred to letter ballot.

It is further suggested to add the following plates: Up-to-date steel hopper car, caboose cars with and without end platforms, passenger train cars not equipped with platforms, with and without projecting end sills, also with wide vestibules.

The committee does not approve the addition of these plates. A change of the hopper car cut would not add any information regarding appliances and that is the only object of the cuts. As to cabooses and passenger train cars, these are not generally in interchange to an extent requiring this special information and the text of the Standards is deemed sufficient.

Another member suggests that the heights of steps should refer to those of empty cars, as, when measured loaded, they might be below the limit.

The committee considers this a rather finely-drawn distinction, as the height of lower tread is stated at "about" 24 inches, which would be taken to mean with usual variations.

Another member suggests "that all the matter pertaining to Safety Appliances be published in pamphlet form similar to the Rules of Interchange, or else embodied in that publication, so that inspectors may become more familiar with the requirements.

The special committee of 1908 on this subject made a similar recommendation in its report.

The committee approves this suggestion.

TANK CARS.*

Axles.—Rule No. 23 of the present Code of Interchange Rules requires all cars to have their light weight and capacity or their light weight and maximum weight stenciled on them, whereas the "Requirements for Tank Cars," which are Recommended Practice of the association, provide for limit weight stenciling. This is causing considerable confusion, inasmuch as the "Requirements for Tank Cars" are given in the published Proceedings, which are not distributed to car inspectors, and no reference is made to same in the Interchange Rules with which they are acquainted. Your committee, therefore, recommends the following change in M. C. B. Rule 23, to provide for tank-car stenciling with limit weight:

"All cars, except tank cars, to have their light weight and capacity or their light weight and maximum weight stenciled on them.

"All tank cars to have LIMIT WEIGHT I or LIMIT WEIGHT II stenciled on them.

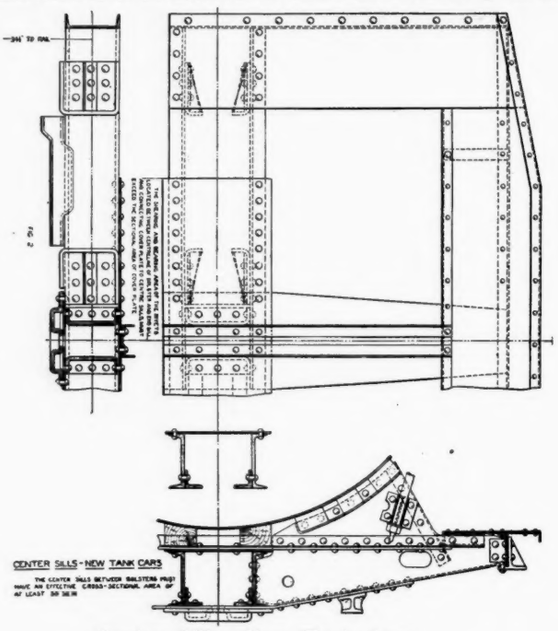
TABLES I AND II.—*For Tank Cars Market Limit Weight I and II.*

	Table I—Limit Weight I			Table II—Limit W't. II.		
Limit weight.	Journal.	Wheel seat.	Center.	Journal.	Wheel seat.	Center.
161,000 lbs...	5 in.	6¾ in.	5⅞ in.	5 in.	6¾ in.	5⅞ in.
132,000 " ..	4½ "	6¼ "	5⅜ "	4½ "	6¼ "	5⅜ "
112,000 " ..	4 "	5⅝ "	4⅞ "	4¼ "	6 "	5¼ "
95,000 " ..	3¾ "	5 "	4⅜ "	3¾ "	5½ "	4¾ "
79,000 " ..	3½ "	4¾ "	4⅛ "	3½ "	5¼ "	5⅝ "
66,000 " ..	3¼ "	4⅝ "	3⅞ "	3¼ "	4⅞ "	4¼ "
58,000 " ..	3 "	4¼ "	3½ "	3 "	4¾ "	4⅛ "

Vent Hole or Small Valve.—In report of last year your committee called the attention of the members to tank cars carrying non-inflammable or non-volatile material not being equipped with vents with the proper size of opening, in lieu of the safety valve or safety vent with lead disk now shown in the tank car requirements. It was further stated that your committee would follow up this question to obtain some reliable data in regard to the exact size of opening necessary for the commodities included under this heading. It developed that tank car owners have no record of any tests showing the minimum size opening of vent necessary to relieve the tank of internal pressure in the case of fire for the various products included under non-inflammable or non-volatile liquids, and tests to determine this for each liquid would be expensive, and, in the opinion of your committee, unwarranted when it is taken into consideration that the maximum expense per car for such a valve will not exceed $5. When, for any reason, splashing of the liquid, such as sulphuric acid, or contamination by moisture, as in the case of linseed oil, is to be avoided, the frangible lead disk will be acceptable. The frangible lead disk for tank cars carrying volatile, non-inflammable products now shown in the Recommended Practice has a 4¾-in. opening, and in order to keep the cost down to a $5 limit we have designed a 2-in. frangible lead disk valve.

For the convenience of tank car owners we present three forms of a 2-in. vent. Vents "A" and "B" are open to the atmosphere and vent "C" has a frangible lead disk. On account of the small cost of these vents your committee feels that there can be no reasonable excuse for tank car owners not providing the tanks carrying non-inflammable or non-volatile material with a vent of the proper opening so as to relieve the tank of pressure in the case of fire and, therefore, recommends that cuts of the three vents be shown in the Requirements for Tank Cars with the following addition at the end of paragraph headed "Vent Hole or Small Valve," after the words "2 in. in diameter," reading:

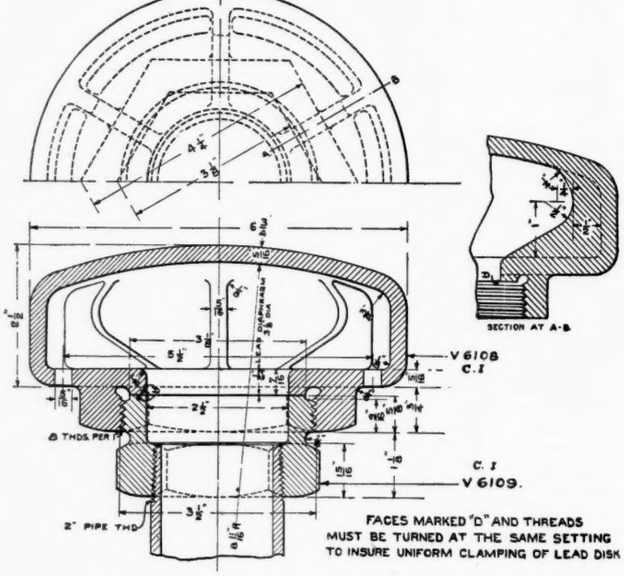
"If for any reason splashing of the liquid or contamination by moisture is to be avoided the 2-in. vent with frangible lead disk, of a thickness which will insure rupture at a pressure not higher than 20 pounds, may be used in place of the 2-in. open vent."



Center Sills; New Tank Cars.

New Tank Cars.

In the last two reports of the Tank Car Committee, attention was called to the inadvisability of preventing longitudinal motion by means of the head blocks. Experience has demonstrated that steel underframe tank cars with head blocks are failing in the center or draft sills forward of the bolster, due to the pounding action of the tank with surging load against the head block. Where actual rupture of the sills does not take place the ends of the cars droop, in some cases, to such an extent that the coupler height falls below the minimum re-


SECTION AT A-B
V 6108
C.I
C. I
V 6109.
FACES MARKED "D" AND THREADS MUST BE TURNED AT THE SAME SETTING TO INSURE UNIFORM CLAMPING OF LEAD DISK

Frangible Lead Disk Vent; Form C.

*Report presented at the annual convention of the Master Car Builders' Association. Committee: A. W. Gibbs (chairman), C. M. Bloxham, J. W. Fogg, William McIntosh, S. K. Dickerson.

quirement. This does not occur where tank is anchored to center sills of proper sectional area between bolsters or where tank is provided with reinforced shell and truck bearing. These forms of securing tank to underframe are generally covered by patents which prevent your committee from recommending any special design to the association; at the same time reference to this general form of fastening should be incorporated in the Recommended Practice for tank cars to indicate to builders of new tank cars the most desirable and economic form of attachment. With this end in view the following changes in the requirements for new tank cars have been formulated:

Change first and second paragraphs under the heading of "New Tank Cars" to read:

"No tank cars built hereafter shall be accepted for transportation unless equipped with steel underframing or with reinforced shell. The design and construction of the car throughout must be at least as strong as the following detailed specifications and must conform to the general specifications given in the foregoing."

Eliminate cuts Figs. 2 and 3.

First and second paragraphs of the present Recommended Practice have been combined, and Figs. 2 and 3 have been eliminated, as they show the undesirable method of fastening tanks by means of the head blocks.

Center Sills.—Change to read:

"The center sill construction of the underframe between bolsters must have *an effective cross* sectional area of at least 30 sq. in. *and distributed as shown in Fig. 2.*"

The italicized additions were inserted to definitely specify the effective cross sectional area, and new Fig. 2 introduced to show continuation of cover plate to secure this, for the reason that failures of center sills have developed in the cases where the cover plate was stopped at the bolster.

Longitudinal Anchorage.—Change to read:

"Particular attention must be given to the longitudinal anchorage of the tanks, which must be thoroughly substantial to prevent end shifting. The preferable method of securing tank against end shifting is by anchoring the tank to the underframe at or between bolster, rather than by means of head blocks, inasmuch as the latter method results in damage to underframe forward of body bolster.

Minimum Requirements for Longitudinal Anchorage of Tank to Underframe.

Tank Connection:

Shearing area of rivets, 25 sq. in.) For tanks of 8,500 gals.
Bearing area of rivets, 20 sq. in..) capacity or over.
Shearing area of rivets, 18 sq. in.) For tanks of less than
Bearing area of rivets, 14 sq. in..) 8,500 gals. capacity.

Frame Connection:

Shearing area of rivets, 12½ sq.in.) For tanks of 8,500 gals.
Bearing area of rivets, 10 sq. in..) capacity or over.
Shearing area of rivets, 9 sq. in..) For tanks of less than
Bearing area of rivets, 7 sq. in..) 8,500 gals. capacity.

The above change is recommended to indicate the more desirable method of anchoring tank to car frame to avoid the rupturing of center sills.

Tank Valve Extension—Clearance.—Change to read:

"Steel underframe tank cars *in which the tank is secured from end shifting by means of head blocks* must have a longitudinal clearance for tank valve extension of not less than 2½ in. on each side of valve."

The italicized portion has been inserted on account of change in paragraph under Longitudinal Anchorage.

Tank Valve Extension.—Clearance.—"Wooden underframe tank cars must have as much longitudinal clearance for tank valve extension as the construction will permit, with a minimum of 6 in. on each side of valve."

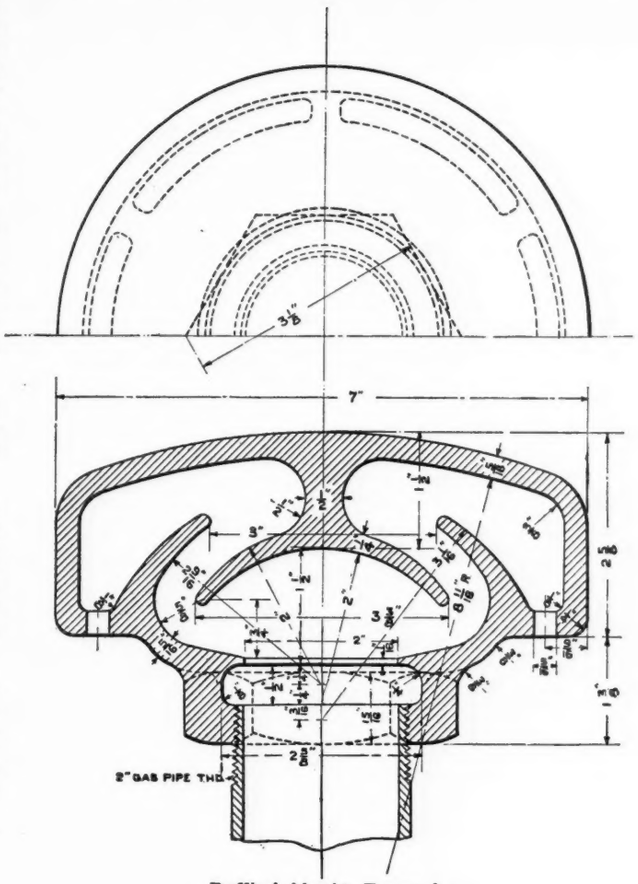
This requirement should be omitted under the heading of New Tank Cars and inserted at the end of requirements for Old Tank Cars Having Wooden Underframes, where it more properly belongs.

Jacking Cars Not Equipped with Side Sills.—On tank cars without side sills no means have been provided for jacking them to facilitate handling in derailments and repairs. Your committee has been carefully investigating this matter, and while not prepared to make a definite recommendation this year, desires to bring to the attention of car builders the necessity of such provision on new tanks to be built in the future. Your committee will follow up this question with a view of making specific recommendations in the report of next year.

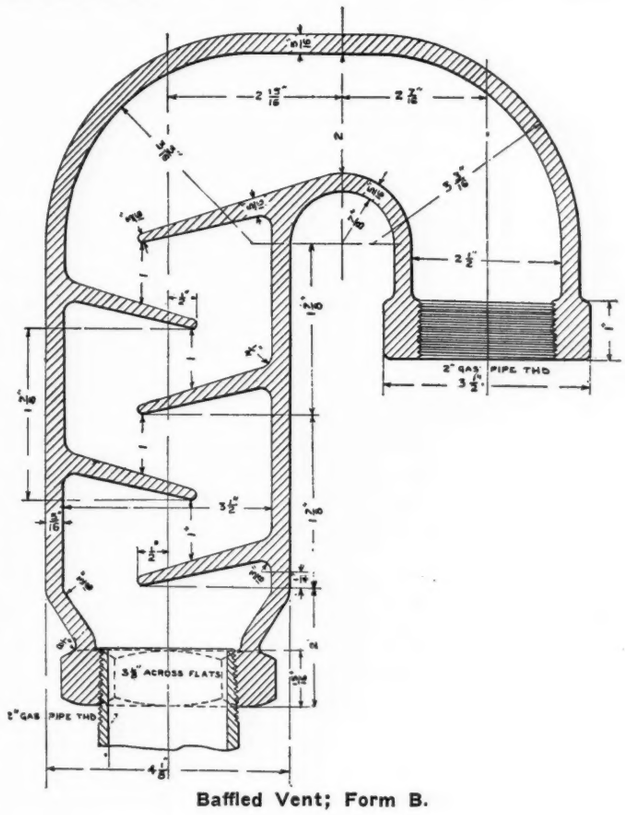
The recommendations of your committee are as follows:

1. That the Arbitration Committee consider the modification of Rule No. 23, Code of Interchange Rules, to include "Limit Weight I" and "Limit Weight II," with tables for axles under tank cars, to agree with the Recommended Practice Requirements for Tank Cars.

2. That the change in paragraph "Vent Hole or Small Valve," and the advisability of incorporating the cuts of Vent Valves A, B and C, as Recommended Practice, be submitted to letter ballot.



Baffled Vent; Form A.



Baffled Vent; Form B.

3. That the first and second paragraphs under the heading "New Tank Cars" be combined, and Figs. 2 and 3, showing the construction of new steel tank cars with head blocks, be omitted from Tank Car Requirements, be submitted to letter ballot.

4. That the change in reading under the heading "Center Sills," and the adoption of new Fig. 2 showing requirements for center sill construction for new tank cars, as presented in this report, be submitted to letter ballot.

5. That the change under "Longitudinal Anchorage" for new tanks, indicating the preferable method of securing tank to underframe, be submitted to letter ballot.

INSULATION.

A short historical sketch of the different methods of insulating refrigerator cars, and the results of tests of the ice meltage in such cars, as conducted by several railways, together with a scientific explanation of the necessity for the heavy insulation recently adopted by several railways and refrigeration car companies, has recently been written and issued in booklet form by the Union Fibre Company, Winona, Minn. The information in this booklet was compiled after a thorough study of the railway car refrigeration subject, covering all designs of cars and methods of cooling, both past and present. In fact, the booklet contains, in a concise form, just the information and data useful to the master car builder. Probably no better idea of the way in which the subject is treated can be obtained than from a glance at the list of contents, which is as follows: "History of the Refrigerator Car; Its Beginnings and Evolution to the Present Type"; "Insulation of Old and Recent Cars; Description of Devices to Keep Out Exterior Heat or Cold"; "Theory of Insulation, What it Does"; "Efficiency of Different Car Constructions in Resisting Heat or Cold"; "Why is More Insulation Necessary for Cars?" "Comparative Insulation for Cold Storage Buildings and Refrigerator Cars"; "What the Tests Showed"; "Test of Pacific Fruit Express Cars; No. 3334 with Common Insulation, No. 2231 with Increased Insulation"; "Test of the Santa Fe Cars; No. 6694 with Two Layers, No. 6675 with Four Layers, No. 6643 with Six Layers of Insulation"; "Summer Test of the Northern Pacific Car No. 98558"; "Winter Test of Northern Pacific Car No. 98558"; "Description and Specifications of Linofelt, the Insulation Used in All the Tests"; "Conclusions—Future Progress in Refrigerator Cars."

Naturally the important subject of refrigeration is the insulation. While it is important to lower the temperature of the car, it is much more important to be able to maintain such temperature when the car is in transit. This particular question has received special attention in this booklet.

We quote the following paragraph, which gives an idea of the thoroughness with which this general subject has been gone into: "Hair felt, since it was the earliest efficient insulation for refrigerator cars in the market, enjoyed a large vogue, but the serious faults which it possesses were not long in developing. Examined under a powerful microscope a cow's hair taken from an insulating quilt will seem to be almost transparent; it is hollow for a short distance from the end, and the remainder of the tube is filled with an animal oil resembling glycerine in appearance. The shell of the hair is very durable, but the animal fat contained in it will decay with greater or less rapidity, depending upon the amount of heat and moisture to which it is subjected. It is impossible to get rid of this fat in any cleaning process, commercially possible. The serious and deadly argument against hair, therefore, is that it is subject to nitrogenous decay, and will not only taint the foodstuffs which are carried in the refrigerator car, but will also disintegrate and fall apart. In fact, nearly every refrigerator car in which this material is used which has been in service for three or four years will, upon examination, show the insulation to have fallen apart. From a sanitary standpoint, too, cow hair is bad, because when an animal dies of disease, even though the meat is unfit for use, the hair is generally used, since the hide goes to the tannery. It was necessary, therefore, to procure a substance which had high insulating qualities, but yet would not decay and become offensive under the most severe conditions. Such a substance is flax fiber, and the insulating quilt made from it is called Linofelt flax fiber refrigerator car lining.

Among the refrigerator tests completely reported are several made on the Atchison, Topeka & Santa Fe and Northern Pacific. The following conclusions are drawn from these tests:

"It is evident from an inspection of the cars now in use, and still more from a consideration of their history and evolution, that the present simple type will long remain standard or tend to become even more simple. The essentials of this type are:

"1. A closed car—as air-tight as possible.

"2. Ice bunkers at each end with adequate capacity.

"3. Efficient natural circulation maintained by the difference in density between cold and warm air and caused by the juxtaposition of these two extremes."

FIVE HORSE-POWER VACUUM CLEANER.

The exhibit of vacuum-cleaning apparatus by the Spencer Turbine Cleaner Company, Hartford, Conn., space 408, has attracted much attention from the railway representatives. It consists of a 5-h.p. two-sweeper, vertical, direct-driven turbine cleaner, equipped with a d. c. motor. This machine has the capacity of operating two hose simultaneously, and it is claimed that the apparatus demonstrates a considerable advance in the art of vacuum cleaning. In any event, it seems to bring an expression of astonishment to all who witness the voracious appetite of the cleaner, to see it take up large bunches of waste, nutshells, cigar stumps, nails, screws and washers as fast as they can be thrown on the floor. It is also a source of surprise to many to see that with this machine dust and flour are easily drawn up through the carpet or rug without injuring the fabric.

The turbine is built on the multi-stage fan principle and is very simple and durable in construction. A complete line of machines from 3 h.p. to 30 h.p. are manufactured, and a vacuum of from 5 in. to 6 in. of mercury at the machine is standardized and maintained practically constant from no load to full load. Deducting the losses in transmission of the air through the hose and piping leaves a vacuum at the tool where the cleaning is being done of from 3 in. to 4 in. of mercury. The machines are designed to exhaust through 50-ft. lengths of 1½-in. hose at 125 cu. ft. of fresh air per minute.

The swivel-cleaning implement adopted by the Spencer company has attracted much favorable attention, and apparently make the cleaning problem in railway cars comparatively simple. From the comments of the railway officers who have seen the demonstration it is believed that this machine is likely to be largely used by transportation companies in the not distant future. The Spencer Turbine Cleaner Company has been building this type of apparatus for over three years, and gives as references dozens of users in all parts of the country. The company has been represented at this exhibition by E. W. Muzzy, vice-president, and R. B. Smith, of the main office; G. H. Noble, of the New York office; S. W. Bowerman, of the Philadelphia office, and C. M. Linthicum, of the Baltimore office.

It was a fitting testimonial to the work of E. W. Grieves for the association that he should have been elected an honorary member. Mr. Grieves has been a member of the Master Car Builders' Association for 24 years, was for seven years vice-president, and he wears the badge of past president as a recognition of two years' service in that capacity. The action of the convention on Monday will be universally approved both among the interests with which Mr. Grieves is now identified and by his former associates in railroad service.

(*Continued from page* 1458.)

confer with the members of the Master Car Builders' Association as to the best methods of overcoming the injurious effects upon track and bridges of salt-water drippings from refrigerator cars. Mr. Fritch was formerly secretary of the association he now represents, and his long experience in track matters fits him admirably for the task that is set before him.

E. N. Williams, of the Sherwin-Williams Company, Cleveland, is attending the conventions and as a member of the Executive Committee of the American Street and Interurban Railway Supply Manufacturers' Association is industriously and enthusiastically shouting for the annual gathering of the American Street and Interurban Railway Association, to be held October next in Denver.

Henry W. Uhl, Inspecting Engineer for Dr. Chas. F. McKenna, consulting chemist and chemical engineer, 50 Church street, New York, is attending the convention. Mr. Uhl was formerly connected with the Union Pacific in various capacities, including assistant engineer of tests, chief inspector of railway equipment for the Harriman Associated Lines, special inspector for the superintendent of motive power at Omaha, Neb., and general foreman of the Union Pacific at Kansas City, Mo. Mr. Uhl now has charge of the inspection department in connection with locomotives, cars and railway materials. Dr. McKenna is said to be a recognized authority in testing work and in his employ are only such men as have had practical experience and know the difficulties encountered by railways. These requirements should assure best results from inspection by this firm.

TO-DAY'S PROGRAM.

Entertainments.
10.30 a.m.—Orchestra concert, Entrance Hall, New Pier.
3.30 p.m.—Band concert, Hippodrome, New Pier.
8.30 p.m.—Band concert, New Pier.

Closing session, M. C. B. Association	9.00 a.m. to 1.30 p.m.
Discussion of reports on:	
"Freight Car Trucks"	9:00 a.m. to 9:30 a.m.
"Painting Steel Cars"	9:30 a.m. to 9:40 a.m.
"Side and End Door Fixtures"	9:40 a.m. to 10:00 a.m.
"Train Pipe and Connections for Steam Heat"	10:00 a.m. to 10:10 p.m.
"Classes of Cars"	10:10 a.m. to 10:30 a.m.
"Salt Water Drippings from Refrigerator Cars"	10:30 a.m. to 10:45 a.m.
"Revision of Constitution and By-Laws"	10:45 a.m. to 11:30 a.m.
"Subjects"	11:30 a.m. to 11:45 a.m.
Unfinished business:	
Reports of committees on "Correspondence," "Resolutions," and such other committees as may be named during the convention	11:45 a.m. to 12:00 m.
Topical discussions:	
(1.)—"Wheel-mounting pressures for various sizes of cast-iron and steel wheels," to be opened by W. T. Gorrell	
(2.)—"Cleaning of triple valves and brake cylinders on freight cars to meet Interstate Commerce Commission requirements." To be opened by T. R. Burton	
Election of officers	1:00 p.m. to 1:30 p.m.
Adjournment.	

WHY IS A MAN LIKE A LATHE?

The American Tool Works, Cincinnati, solves the conundrum: He has "fast speeds" and later his "slow speeds;" by that time he has his "full swing." If his "head" is "out of gear" he is liable to "chatter," which is an "index" of want of "solidity." His "carriage" and "bearing" depend on his "ways," and if he is not tied up to an "apron" string he may "scrape" up bad acquaintances in "casting" about. If he comes home late to dinner and finds everything "chilled," he is wrathy, and this may be called his "cross-feed." If he is "hollow," attends a banquet, eats and drinks for four, this could be called his "length feed," requiring large and small "plates." While going through life he gets many a good "belt" and finds considerable "friction" in trying to "clutch" onto all the money he can. If he fails to pay his rent, his landlord is "bored" and he gets "turned out." If he gets in a "tight box," needs "quick change," "steels" money, and is "chased" out of the country, it is his "finishing out." If he ever amounts to much, he commences by roughing it, then becomes "smoother," and should in time get some "polish." If "worn out" he takes to his "bed" for a "rest." When old he develops "lost motion," gets on his last "legs," then "dies," and is finally "chucked" in the grave, under his last "cover."

ALBERT WAYCOTT.

At a meeting of the Executive Committee of the Railway Supply Manufacturers' Association, June 21, A. L. Whipple told of the valuable work done by Albert Waycott in connection with the formation of the present association. He pointed out the fact that Mr. Waycott is the only ex-chairman of the Committees that existed prior to 1900 still actively engaged in the supply business who had not been honored by being presented with a badge like that given at the annual meeting to retired chairmen. It was decided that a badge be made and presented to Mr. Waycott and that this action be published in the *Daily Railroad Age Gazette* as a public testimonial to Mr. Waycott's splendid work in behalf of the association.

Heywood Brothers & Wakefield Company, Wakefield, Mass., show a full line of their car seats with the latest improvements. One new style is the New Haven standard, which has been furnished for all the passenger cars built for that road this year. The exhibit shows seats upholstered in rattan, plush and leather. They also show samples of reed parlor car chairs.

The Watson-Stillman Company has on exhibition a 200-ton hydro-pneumatic wheel press fitted with a device which rapidly pushes out the ram to the work instead of the old slow method of pushing out the ram with the low pressure pump. They are also showing a 100-ton reverse cylinder forcing press made for the Central Railroad of Georgia, with a crane attachment to facilitate the handling of heavy work. One shop tool in the booth is a portable shaft straightener. It can be fitted to any lathe bed, and it may be used as a punch by fitting a die on the nose of the ram. There are other Watson-Stillman specialties shown, such as motor and gas driven turbine pumps, crank-pin presses, rail benders and hydraulic jacks.

Edward H. Chapin has recently been elected vice-president of the National Car Wheel Company. This being his first visit to the convention since his election, his numerous friends are congratulating him upon the honor that has been conferred upon him.

Walter E. Coffin, who, as stated on Tuesday, recently came up from Mexico and may be now on his way to the North Pole, will go, if at all, under the flag of the National Malleable Castings Company, and not under that of one of its competitors, as was accidentally stated.

The Baker-Pilliod valve gear, as applied to locomotives on the Chicago & Alton, the Chicago & North Western, the Central of Georgia, the Chicago Great Western and the Toledo,

St. Louis & Western, is fully described in a pamphlet recently issued by the Pilliod Co., Chicago. The model of a locomotive with this gear is attracting much attention at the convention. Anyone interested in valve motion should get a copy of this pamphlet.

The U. S. Metal and Manufacturing Company, New York, is showing in its booth the "Ideal" automatic car coupler. The novel feature of this coupler is the disappearing knuckle. By this action all other M. C. B. couplers can be coupled with the Ideal whether their knuckles are open or closed. The Peerless cast steel truck bolster is also shown by this company. The Feasible drop brake staff has been applied on many flat and drop end gondola cars within the last year.

The Lloyds have accepted the Linde Air Products Company's oxy-acetylene low-pressure method of welding on marine boiler flues.

As an experiment, "Agasote," a fireproof fiber board, made by the Pantasote company, was submitted to test in the booth of the Davis-Bournonville Company. It was found that this material will resist the oxy-acetylene flame at 6,300 degrees under pressure twice as long as steel.

The large demand for Grip nuts necessitates a duplication of the Grip Nut Company's present plant. The company is installing a battery of 15 presses. The success of this lock nut is said to have been due to its positive clinging qualities, as it locks itself upon the bolt threads so firmly that nothing short of a wrench can remove it.

The Sherwin-Williams Company, Cleveland, does not make an exhibit this year, but its able representatives are everywhere in evidence. They are: W. B. Albright, E. M. Richardson, E. N. Williams, Thomas Madill and Fred Elmquist.

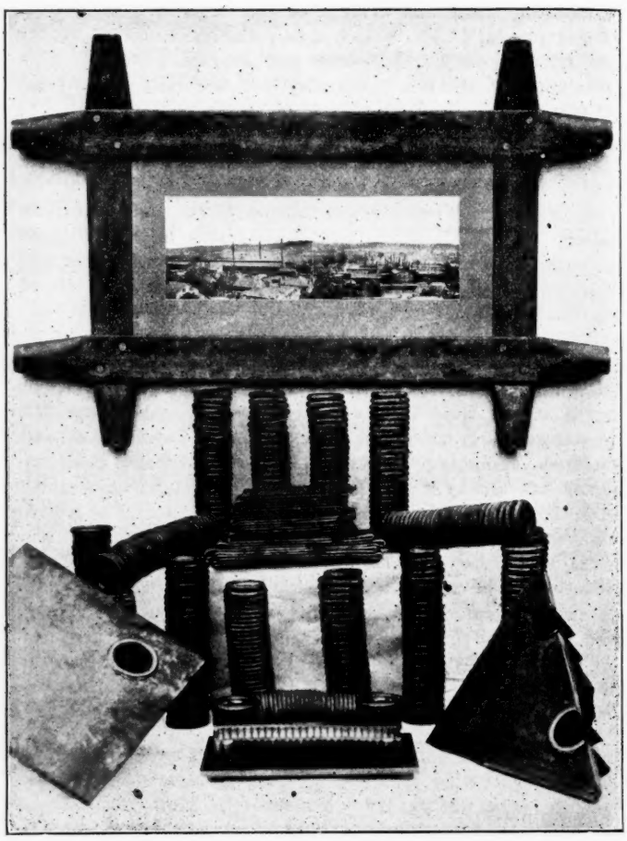
The Universal window fixtures manufactured by the Grip Nut Company, Chicago, and exhibited at booth 432-434, are attracting a great deal of attention. The novel features of weather stripping applied to both sides, as well as to the top and bottom of the window sash, is fully appreciated by railway men.

The Union Fibre Company, Winona, Minn., booth 502 Annex, have two successful insulations or linings for steel passenger coaches. One is Linofelt, a flax fiber quilt used extensively in refrigerator cars. For steel car work Linofelt is covered with asbestos. The second type is Lith, a rigid but soft board, which is also covered with asbestos. Both are being applied largely in steel car work with excellent results.

One of the interesting tools exhibited this year is the Paragon high speed flat twist drill made by The Cleveland Twist Drill Company, Cleveland, Ohio. The feature of this tool is the advantage of the regular taper shank drive by the use of Paragon sockets, thus eliminating the necessity of using a chuck. These drills are additionally strengthened by having the next larger size shank than those made with the solid or welded shanks.

CHARCOAL IRON BOILER TUBES.

The accompanying illustration shows the test possibilities of the charcoal iron boiler tubes made by the Parkesburg Iron Company, Parkesburg, Pa. The test pieces here shown are on exhibition in the company's booth, 388. The behavior of these tubes in crushing tests is shown in what appears to be coiled springs, while they are really 33-in. tubes crushed to about 9-in. Another interesting test piece is 16-ft. tube mashed flat and doubled on itself, making a pile of 15 layers without sign of fracture. These tests are all made cold. Through



these this company has proven that the art of making a high quality, ductile, charcoal iron has been preserved.

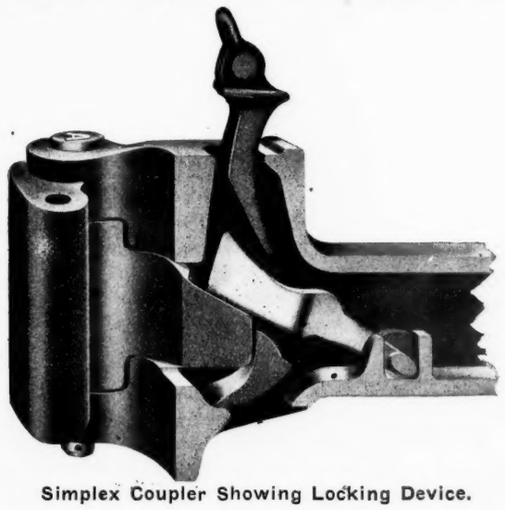
EXHIBIT OF THE AMERICAN STEEL FOUNDRIES.

The American Steel Foundries, Chicago, has its exhibit in the same spaces as those occupied last year. A car truck, revolving on a turn-table, as heretofore, is the main feature. About this truck are grouped the other exhibits. The truck, with the exception of a few parts, is complete with products of the company's manufacture, the latter including Davis cast steel wheels, Andrews cast steel side frames, cast steel journal boxes, Simplex springs, Simplex truck bolster, cast steel body bolster, Susemihl roller side bearings and Simplex brake-beams. On suitable racks are mounted a Simplex coupler with top operating device, an R. E. Janney pilot coupler for locomotive tender service and Simplex couplers with bottom opening device operated, from within the guard arm or knuckle side for either passenger or freight service, by a lever from the side of the car.

The first of these couplers is arranged to couple with an R. E. Janney coupler mounted on a truck which is moved on a short section of track by means of compressed air, thus showing both the Simplex and Janney couplers in actual operation. The R. E. Janney coupler is well known and at the present time over 500,000 are in service. The Simplex coupler has been on the market but a few years, and some of its features are a large locking surface on the knuckle, coupler wall and lock; short lift required to operate. A 2-in. lift will uncouple, 3¾-in. lift will throw the knuckle open to the extreme limit; the knuckle opens in line with the coupler ear, giving the greatest possible opening, so that it is not necessary to open the knuckles of both couplers in coupling; section of metal forward of lock hole through the

face of coupler 1¼ in. thick at the throat, 1⅞ in. thick at the top; positively throws the knuckle wide open from any position; lock-set acts positively for any position in which coupler may stand; lock can also be dropped from the lock-set position to the locked position by uncoupling lever; anti-creeping device prevents accidental uncoupling through creeping of the lock; uncouples automatically in case draft gear pulls out; adapted to side uncoupling; applicable to passenger equipment, knuckles and locks interchangeable for freight and passenger coupler. This coupler does not require special chain or parts in attaching to uncoupling lever, and it takes the standard M. C. B. link and clevis. The side operating freight coupler can, by means of the uncoupling lever, be centered without going between the cars. A Leeds reversible pilot coupler for locomotives is also exhibited, as well as various coupler locks, lifters, knuckles, etc.

Probably the feature of most interest in the exhibit is the Davis cast steel wheel. The fact that this wheel has made, in actual road service, from two to three times the mileage of cast iron wheels is sufficient to cause the merited attention which it is receiving. Although originally intended for use under 100,000-lb. capacity cars, where cast iron wheels are not giving very good service, the Davis steel wheeel is at present in use on over 50 roads, used for passenger, freight



Simplex Coupler Showing Locking Device.

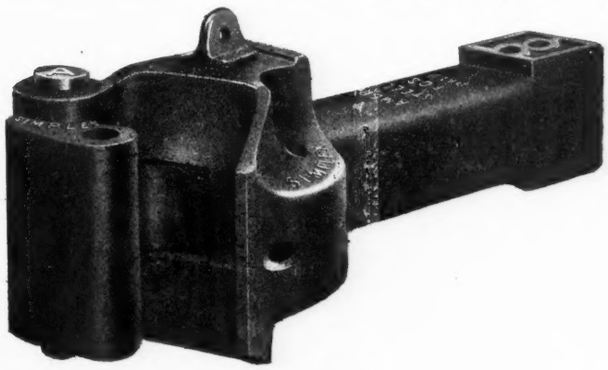
and tender service. The Davis wheel is cast in a revolving mold, the metal being poured at the center. With the first metal that enters the mold, powdered ferro-manganese is added, the supply of which is shut off after the rim and tread have been filled. The result of this operation is to secure a high manganese steel in the tread and flange, and a low manganese steel in the plate and hub. The wheel is then annealed, the tread and inside of the flange being further hardened with a water spray, giving a tough material to resist wear, while the metal of the hub is soft and workable to facilitate machining for the axle fit. Being too hard for machining, the periphery of the wheel is ground from the apex of the flange to the outside of the tread, insuring a perfect wearing surface. The wheel is said to be within a few thousandths of being perfectly round. For 100,000-lb. capacity cars, it weighs about 600 lbs. One of the particular features of the Davis wheel is great strength and safety. From the wheels on exhibition three triangular sections have been cut, extending from the circumference to a point about halfway between the tread and axle fit. These sections show extreme solidity of metal, which from its appearance is as solid as a rolled steel section. Each wheel leaving the works is subjected to a test of three blows, at different points on its plate, of a 500-lb. weight, dropped 11 ft. With the wheel as now made, even better results than heretofore are being secured.

The Andrews cast steel side frame, of which some 400,000 are now in service, and which is said to be standard on a number of the largest railway systems of the United States, is shown in the assembled truck above referred to. This frame gives a side construction of one piece for the truck and replaces the arch bars, columns, column bolts, nuts, brake hanger brackets, spring seats, etc. It is easy to assemble, and it is claimed that the saving in repair costs as well as that due to the shorter time the cars are out of service for repair is material and fully justifies the replacement of the old form

Simplex Coupler Open.

of truck frame by that of cast steel. The construction is very strong, and especially on the larger cars is in many cases replacing other forms of construction. This frame is covered by a number of patents, the basic patent covering an integral side frame having a bolster receiving opening, which is contracted in its upper portion.

An elaborate exhibit of springs includes both coil and elliptical for all classes of cars and locomotives. Coil springs of standard M. C. B. dimensions for cars are shown further in connection with the Sloan spring controller, especially ap-



Simplex Coupler.

plicable to passenger equipment and freight cars carrying live stock, etc., where it is essential to secure more easy riding than is obtained with the ordinary coil spring. Elliptical springs with patented clips and of various sizes and group arrangements are shown.

Susemihl roller side bearings, of which some 200,000 are now in use, are displayed, there being various designs to suit different arrangements of truck parts. The bearing consists of two hardened steel rollers fitted in a carriage and operating between top and bottom hardened steel plates. It is designed so that all parts remain intact with the truck bolster in case the car becomes separated from the latter and it is impossible for any of the parts to fall out or to get out of place. There are no springs, bolts, rivets, or other small parts to become misplaced or to be lost. The bearings are further designed to allow for a travel equal to the greatest

possible movement between car body and truck, even when rounding the sharpest side-track curve.

Simplex solid I-section (Acme), trussed freight (Ajax) and trussed passenger (Hercules) beams are displayed. A specialty is being made of the new Hercules trussed beam which employs a specially rolled channel for the compression member and a rod for the tension member with malleable and cast steel fulcrums. These beams are designed to meet all classes of service from light freight to the heaviest high-speed passenger. Beams for the latter service are designed with or without adjustable heads, the adjustable feature allowing the beams to be used in any position from 6 in. above the rail to the center of the wheel. In adjusting the heads it is only necessary to remove the ½-in. cotter pin, put the shoe into the position desired and replace the pin, an operation easily understood by any class of labor.

Cast steel and Simplex body and truck bolsters are shown, the cast steel truck bolsters embracing various types, including I-section, T-section, box and open-end V-section for various capacity cars.

A new feature of the exhibit this year includes two cast steel draft arms, employed to strengthen the ends of cars of light wooden construction. On these cars no parts require more constant repair than the old wooden draft timbers. The cast steel arms replace these draft timbers, being bolted to the center sills and designed to receive the wooden end sills and to extend either through or over the body bolster to a point beyond the latter. Designs are easily diversified to accommodate different forms of draft gears. By the use of these cast steel arms many cars otherwise unfit for service will be made sufficiently strong to operate in trains with the heavier cars of all-steel construction.

Miscellaneous castings in the exhibit consist of a cast steel locomotive driving wheel center, locomotive cross-heads and truck end and column castings.

The revised and corrected list of representatives at the conventions is as follows: R. P. Lamont, G. E. Scott, R. H. Ripley, D. W. Call, J. C. Davis, T. D. Kelley, A. S. Blagden, M. R. MacLean, A. R. Brunker, G. E. Slaughter, H. W. Petty, H. W. Green, G. G. Floyd, T. E. Cook, F. K. Shults, A. S. Crozier, F. B. Ernst, J. S. Smith, H. P. Shaw, J. R. Stuart, P. J. Kalman, J. W. Dalman, J. V. Bell, L. E. Jones, C. C. Hopkins, A. S. Blanchard, W. Ross Gravener, J. S. Goddard, C. W. Lytle, H. L. Allen, E. P. Kinne, J. Reid, A. McNaughton, C. F. Murray and R. E. Janney.

THE TRACK EXHIBIT.

The track exhibit on Mississippi avenue is not as elaborate as on previous years, and is confined to two motor, one dump, one flat, two box and five drop-bottom cars. Of the motor cars one is the General Electric gasolene-electric car. This car, with the exception of a few minor changes in detail, is the same as that used in service tests on the Lehigh Valley. In these tests it was found possible to operate the car on one-half gallon of gasolene per car mile. The car on exhibition is 50 ft. long over all, and is equipped with an eight-cylinder gasolene engine capable of developing about 125 h.p., directly connected to a generator of the interpole type of 90 kilowatt capacity. It weighs 70,000 lbs., of which 65 per cent., or 45,500 lbs., is upon the motor truck, which is equipped with two 100 h.p. direct current motors. The engines are arranged to start with compressed air that is carried in storage in tanks beneath the body of the car. This is entirely separate and distinct from the air-brake supply, though compressed by the same pump. Under the conditions of operation the compressed air is first delivered to the main air-brake reservoir, and the excess goes to the storage tanks. In no case is it possible to draw on the air-brake supply for starting the engines. In case everything is cold, and the tanks empty, a small engine is used for the especial purpose of pumping up an air pressure, and when this has been obtained the engine can be started at once.

The engine may be operated continuously, but owing to the ease with which it can be started the natural method would be to shut off whenever a station stop is to be made, or when the engine is to drift for any considerable distance. In addition to this, the regulation is such that the voltage can be varied from about 180 to 650, so that there is not only great flexibility in the working of the car, but it can be started very evenly and smoothly. This, in part, because the power plant is directly under the immediate control of the engineer.

The direct current gives an added flexibility of operation and adaptability to the car. If, for example, it should be desired to run the car over the rails of a city track, where the authorities were unwilling to have a gasolene engine at work on the streets, it would be quite possible to put a trolley connection on the roof and take the current from an overhead wire, and thus lead directly to the motor and propel the car like an ordinary street car, with the engine and generator cut out and standing.

The other motor car was built by the Baldwin Locomotive Works for the Railway Auto Car Co., of New York, and is the first of its kind. It is a radical departure from ordinary motor car construction. The engines are placed in a frame resting on the two axles of the truck and are entirely encased, so as to be thoroughly protected against dirt and grit from the outside. In at the back of the cab there is a locomotive boiler placed athwartship. Its tubes are 294 in number, 1¾ in. in diameter and 58 in. long. The following are some of the other principal dimensions of the car:

Length		50 ft.
Seating capacity		48
Boiler, diameter		56 in.
Heating surface, tubes		636.5 sq. ft.
" "	firebox	60.5 "
" "	total	697 "
Grate area		14 "
Steam pressure		160 lbs.
Drivers, diameter		36 in.
Cylinders, diameter		12 "
Piston stroke		12 "
Tractive power		6,500 lbs.
Weight, total		100,000 "

The dump car is the Oliver, made by the William J. Oliver Mfg. Co., of Knoxville, Tenn., and is one in which the whole platform is tilted to one side or the other, according to the position in which the load is to be deposited. It stands rather high and is carried by cast steel brackets, to which the center sill of the floor is pivoted and which themselves rest on the center sills. When in use it is held in place by four chains leading from the side sills to the truck bolster, and when the car is dumped these chains are first unhooked, but when in the dumped position they do not drop low enough to catch in any obstructions in the track, so that the car can be moved in this position.

The dumping is done by compressed air, which is taken from the train pipe through a simple valve into a large reservoir. This reservoir is of sufficient capacity to dump the car four times light, or twice with the load. The air is admitted from the reservoir through a cock at either end of the car to the dumping cylinder which it is desired to operate. There are two of these cylinders, one on either side of the center sills at the center of the car. They have an inside diameter of 18 in. and are hung well down, so that their bottoms are but a few inches above the rails, and they are protected by fenders at the front and back to sweep off any obstruction that might lie between the rails. The pistons of these cylinders act through connecting rods directly against the body of the car itself. The pressure is applied through a cast steel bracket against a 10-in. channel bolted to the floor plank, thus distributing the load over the body. This lifts one side and dumps the car to the opposite side. The body is then righted by a similar action by the other cylinder.

When the air is admitted to the cylinder for dumping the load the pressure in the train pipe is reduced about 10 lbs., which automatically makes a light application of the brakes

for the purpose of holding the car while unloading. After the completion of the dumping the full train line pressure is resumed and the brakes released. As the car body is turned the sides are opened out and thrown into a nearly horizontal position, so that there is no obstruction to the flow of the load. They are, of course, swung back to the vertical, when the body is returned to the normal. This is accomplished automatically by means of a combination of levers and connections attached to the body and the rigid portion of the framing.

The Enterprise Railway Equipment Co., of Chicago, shows a hopper bottom and drop-bottom gondola car, each having a capacity of 100,000 lbs. The characteristic feature of this car is the winding gear for operating the drop doors. This consists of a winding shaft, upon which there is a square sheave. The chain consists of four links of flat iron connected by pins, and each link of such a length that it will just cover one side of the sheave, so that it makes one complete turn when wound and is drawn down close. The cams and sprockets for holding the whole in place, under load, do not differ materially from the common arrangements of ordinary practice. It is this one point of the methods of raising, lowering and holding the doors that constitute about the only feature of the exhibit of cars this year.

The Ostermann Manufacturing Co., of Chicago, shows two cars, one a long, flat car, with a brake staff that can be turned down out of the way for loading long material and with deep, built-up side sills. This car has a capacity of 100,000 lbs. The other car is a side dump ballast car, in which one-half the floor is dropped to an inclination sufficient to discharge the load, and the lower half of the side is lifted vertically out of the way. This movement is accomplished by a hand operation, and the doors for one-half the length of the car on one side are worked by each operator, so that four, in all, are required for the complete unloading of the car. The mechanism is very simple, and consists of a shaft set upon the sides and running the length of the car; it carries five crank arms. As this shaft is turned by means of a long lever its crank arms lift the four side doors, and, through a connection, also turns a lever pivoted to the cross ties. The other or inner end of this lever carries, with its mate at the other end of the door, a roller, upon which the door rests. As this roller is dropped the door falls to the discharging position. Incidental to this construction, the car has no side rolls, but is provided with heavy center sills and seven deep and exceedingly strong cross ties that carry the doors after the manner of a cantilever girder, or a girder supported in the middle and extending out on either side.

The United States Metal & Manufacturing Co., of New York, has a wooden exhibition car, on which there are shown a number of modifications of a method of holding hopper doors in position. This method is merely that of a toggle joint that is turned past the center when the door is closed, so that the clog may be raised from the clip and the door will not fall, because of the position of the toggle, which requires that it shall be slightly raised before dropping. The car is also equipped with a brake staff that can be turned down out of the way for long loading, and with the Ideal coupler.

Finally, there are two old box cars of the Wabash and Michigan Central, respectively, that are fitted with the Hutchins' all-steel carline roof, and which are here for the purpose of showing the durability of the structure, and the same may be said of a Bettendorf drop-bottom gondola of the Chicago, Burlington & Quincy, as showing the durability of the Bettendorf construction.

With the exception of the motor cars the track exhibit this year is marked by a notable absence of important novelties in car construction, which may be taken as an indication that the steel car, which is the only type that modern conditions would make it worth while exhibiting, has been developed to a point where its novelties consist in variations of detail and not in the underlying principles of construction.

Exhibitors and Others

An examination of the various devices illustrated and described in the technical press recently seems to indicate a decided necessity for and serious attempts to improve the present practice in mounting air brake hose. A very radical departure from the present standard is the N B air brake and signal hose connection being exhibited by the George M. Newhall Engineering Company, Philadelphia, Pa., space 352. Extended trials over a period of three years have demonstrated its superiority over the present tube destroying internal nipple and band mountings.

* * *

The exhibit of the Diamond Rubber Company, Akron, O., comprises different articles manufactured of rubber used by the railways, including air brake, water, steam and air hose. The exhibit is instructive, showing, as it does, rubber in the crude and in the different processes preparatory to manufacturing into finished product. The company also shows pneumatic and solid Diamond tires; rubber insulated wire and cable, and hard rubber battery jars and accessories used in the storage batteries for train-lighting purposes. It is distributing a booklet illustrative of the different articles in question, showing the growth of the plant in eleven years, from two acres to thirty-one. This pamphlet also contains an interesting conversation between a railroad man and a representative of the Diamond Rubber Company. Those in attendance are: I. R. Bailey, Akron; T. J. Smith, New York; W. E. Hardy, Akron, and G. D. Pilgrim and W. T. Bowne, Philadelphia.

* * *

The David Lupton's Sons Company, Philadelphia, Pa., is exhibiting its new product—a rolled steel window sash. This has all joints welded by the oxy acetylene process, making the joint all one piece and preventing corrosion. The Pond window operating device is also made by this company and Mr. Pond has a small model which clearly shows the tension transmission of power, the phosphor bronze bearings and immersed gearings which are features of this device.

* * *

Something entirely new in connection with the vestibule passageway curtains which are used to cover the diaphragm between cars is being shown by the Curtain Supply Company, Chicago, space 26, in the shape of a release handle which automatically releases the curtain when the cars are uncoupled, and thus prevents torn, damaged and lost curtains. The failure of brakemen and yardmen to properly unhook these vestibule curtains, before the cars are uncoupled, results in many injured curtains and in frequent cases the entire curtain is pulled from the roller and becomes lost or stolen. The replacement of such curtains is an item of considerable expense, which, it is said, can largely be eliminated by the use of this device. This new type of handle applies the release principle to the handle. Many forms of releasing the curtain in connection with the hook and other parts have been tried without, for a number of years, material success. The device is simple, the cross bar of the handle being pivoted at one end and free to move and release at the other. When sufficient pull develops as the cars are uncoupled, the release end of the handle is held in place by a torsion spring. A full size working model is used to show this device in operation. The company is also exhibiting its usual full line of curtains and curtain fixtures, including the Ring No. 88, Forsyth No. 86, and Keeler eccentric in several styles of bottom finish with front and drop handles, of which No. 88 is considered the leader.

* * *

"Doc" W. H. S. Bateman is wearing his usual Victor riveted charcoal iron smile. Mrs. Bateman and the Bateman boys, Master Huston and Stanley, came down from Philadelphia

on Saturday to spend a few days in visiting with convention friends.

* * *

Steel can be welded to cast iron, and brass, copper, steel and German silver can be welded into one piece. Aluminum is also welded successfully as is boiler plate. Demonstrations are being constantly given at the special booth of the Davis-Bournonville Co., New York, at the rear of the Greek Temple.

* * *

W. J. Caton, formerly of the American Lumber & Manufacturing Company, Pittsburgh, Pa., was recently elected vice-president of the United Timber & Lumber Company and will have charge of their eastern office, 810-812 North American building, Philadelphia, Pa. The main office is Chicago, and J. K. Joice is president. The United Timber & Lumber Company, while a new title, is the consolidation of three old established companies owning their own mills in the South. Mr. Caton has been in attendance at the convention accompanied by his daughter. He is a member of the Transportation Committee.

* * *

Charles H. Besly & Company, Chicago, are showing one of their No. 14 Besly spiral disc grinders under power at space 128, Machinery Hall. This machine is used in perfecting all kinds of flat surfaces, such as locomotive keys, rod straps, bearing brasses and the flat sides of bolt heads and nuts. This company reports, in addition to a good general railway business, a recent sale of four of these machines to the St. Louis & San Francisco for use in its new shops at Springfield, Mo. The company is also showing its new Helmet temper forged tap, which is made in all kinds and sizes.

* * *

In the good old days of automatic car coupler inventions, the farmers played an important part. We had supposed that the plague had been stamped out; but one Farmer is here with a new device and it's for people to hang on when there's standing room only.

* * *

If you want to "rubber," visit the exhibit of the Kerite Insulated Wire & Cable Company, booth 447-9. There's plenty of opportunity in the form of one of the most perfect biscuits ever imported into this country. It weighs 736 lbs.

* * *

The Homestead Valve Manufacturing Company, Pittsburgh, Pa., is not exhibiting at the convention this year, but is represented by P. L. Rhodes, who has attended several conventions and is well known among the different railway officials. The company announces that the Homestead locomotive blow-off valve has been adopted by several large railways during the past year and report a very satisfactory increase in business from all of its old customers. The Homestead valve is recognized as one of the best valves for locomotive blow-off purposes on the market, but it is not only successful for a blow-off valve, but on any other difficult surface some of the valves being in use on extremely high pressure and on acid and other destructive liquids.

* * *

The Massachusetts Mohair Plush Company, Boston, Mass., has recently produced some new effects in mohair car plush. A very low pile plush in figured goods is now extensively used. A greater proportion of the surface of this plush is formed by uncut loop, while the figure itself is cut pile or plain nap, and the whole is beaten up close in the loom. For these reasons there is less chance for the collection of dust and the surface feels less like a pile fabric. This company believes that this effect is coming to be very popular. The other new effect is the repousse. This consists of a figure embossed on plush which is apparently panned, giving the effect of silk. The figure is absolutely fast, the wearing qualities are said to be proving excellent and the appearance is very pleasing. Both these new plushes are on exhibition on the Pier. J. S. Seabury, representing this company, is stopping at the Marlborough-Blenheim.

The Railway Materials Company, Chicago, has just issued a very complete catalogue on Ferguson shop furnaces for railway shops and manufacturing plants. These furnaces are designed for burning oil and are made in several designs, including rivet, forging, spring-banding, case hardening and flanging furnaces. The catalogue contains a large number of half-tone and line illustrations of these furnaces.

* * *

The Creco slack adjuster is exhibited by the Chicago Railway Equipment Co. Those interested in such a device will find this adjuster, for both passenger and freight equipment, worthy of careful examination.

* * *

The American Nut & Bolt Fastener Co., Pittsburgh, Pa., commenced the manufacture of Bartley positive nut and bolt fasteners in July, 1902, in a factory 24 ft. x 40 ft. At this time the company made fasteners by hand, the machinery not being ready then. Fasteners had to be got out to fill orders, making about 400 per day with 12 men. Now, this company has a factory equipped with the most improved automatic machinery, with a capacity of 200,000 fasteners per day. This company manufactures over 700 different kinds, shapes and sizes of Bartley positive fasteners. All it requires is the size of a bolt and a pencil sketch showing surrounding dimensions, and the American Nut & Bolt Fastener Co. can furnish fasteners to fit.

* * *

Fine grinding is acknowledged to be an indispensable requisite for the production of a good protective pigment for paint, and it is frequently claimed that this cannot be accomplished with silica. The Joseph Dixon Crucible Co., Jersey City, N. J., knows that it can, for recent microscopic examinations of this material used in its silica-graphite paint show that the grains are rarely larger than one-two-thousandth of an inch across. This, of course, makes an impalpable powder that will pass through the meshes of almost any sieve that can be constructed.

* * *

It has been proved that the fire which followed the Castle Rock, Utah, wreck, last March, originated in the baggage car, which was lighted with oil lamps. On the other cars, which were equipped with Pintsch gas, none of the tanks were ruptured; a fact which adds another strong testimonial to the safety and reliability of the Pintsch equipment under severe and trying conditions.

* * *

Sixty million (60,000,000) Bartley fasteners, made by the American Nut & Bolt Fastener Co., Pittsburgh, Pa., are now in use. They are used on many railways of the United States, and by the car companies and by other industries. They are also used in Canada, Japan, the Philippine Islands, Cuba, South America, Mexico, Africa and nearly all over the world.

* * *

The Wells Unbreakable file handle, made of malleable iron, for heavy filing, is a really good thing. The Wells Light Manufacturing Co., Jersey City, N. J., is responsible for this novelty.

* * *

S. L. Smith, general manager of the Coupler department of the National Malleable Castings Co., Cleveland, O., was here for a couple of days last week but was called away on business. Mr. Smith, however, returned Monday and is on the job and expects to remain during the rest of the convention.

* * *

Headlight chimneys that will not break from the sudden expansions and contractions caused by the heat of the light and by the cold air which is bound to sift into the best headlight cage, and which will not be jarred to pieces when the engine couples on to the cars or bumps over the frogs and

crossovers in the yard, will not only save in cost of chimneys, but will insure against the burning up of headlights sometimes caused by a broken fragment of chimney turning the flame down around the oil reservoir. This is one of the points on which the Storrs Mica Co., Owego, N. Y., recommends its Never Break mica headlight chimneys, which are used by a large number of American railways.

* * *

The Cardwell friction draft gear, type G, is being exhibited by the Union Draft Gear Company, Chicago, at spaces 476 and 477. This is the type of the Cardwell gear which is said to have made a remarkable showing in a public draft gear test recently made. In the test referred to this gear is said to have done 1,129,500 ft. pounds of work, or nearly 36 times more than was done by two class "G" M. C. B. springs. The superiority of friction draft gears over spring draft rigging was demonstrated by the above test. It is claimed by the manufacturers of the Cardwell gear that its use effects a great saving in cost of car repairs. This gear has been applied to thousands of cars in the past five years, and the fact that it is being applied to thousands of cars under construction at the present time would seem to bear out these claims.

* * *

Steel car construction is said to be greatly facilitated by the use of the Davis-Bournonville oxy-acetylene process. The American Car & Foundry Co., New York, has two of these plants in operation. Samples of work are on exhibition at the booth of the Commercial Acetylene Co., New York, space 201-209, and practical demonstrations are being given in the special booth at the rear of the Greek Temple.

* * *

The Buffalo Brake Beam Co., New York, is much gratified by the favorable comments being made on its new truss brake beam, which it is showing for the first time at this convention. The beams are made in three sizes, Nos. 1, 2 and 3. The No. 3 beam has adjustable head for high speed passenger service.

* * *

New uses for air tools are constantly arising and this naturally draws attention to the importance of rubber air hose in this connection. The ideal hose for this purpose must be strong, not too heavy, firm enough not to kink easily and satisfactory as to durability and wearing qualities. Concerns which have had wide experience report that the Forsyth braided hose made by the Boston Belting Co., Boston, Mass., comes nearer filling the above described conditions than any other hose which has come under their observation. Each ply of the circular braided fabric in the hose is absolutely seamless and complete in itself. It is constructed of yarns which are practically the same as fish lines. Each ply of the braided fabric is woven double strand. The hose has a perfectly smooth inside and while on mandrels it is vulcanized by direct contact with live steam, a process which makes the same grade of rubber tougher and stronger than when vulcanized by any other method. A special bulletin on Forsyth braided hose is issued by the Boston Belting Co., which may be obtained by any applicant.

* * *

The Creco journal box and lid exhibited by the Chicago Railway Equipment Co. last year has been greatly improved during the year and visitors will find it of interest to examine the novel and successful manner in which the box lid is arranged to keep tight, and the features designed to meet the other requirements of service. The Creco lid may be applied to any M. C. B. standard box, and any M. C. B. standard lid will fit the Creco box.

* * *

There is on exhibition in booth 444 the famous Joyce-Cridland hydraulic jack for master mechanics and master car builders who appreciate reliability, time and labor-saving devices, good mechanical details and efficiency under extremely heavy loads. These cast iron hydraulic jacks are said to be made of best grade of steel and phosphor bronze in the vital parts. The company has its own steel casting foundry and oil-fired case-hardening furnaces. All heavy forging is done on a two-direction hydraulic press, using special dies, and the machine shop is fitted with tools made especially to meet the requirements. Tempering is done in oil baths. All standard models and sizes of racks are carried in stock for immediate shipment. The product includes all varieties of lever, screw and hydraulic jacks for every trade and special kind of work.

* * *

The Keystone Safety Starting Handle Company, Philadelphia, Pa., has an exhibit in space 375, in the shape of a working model of a safety starting cranking device. It is claimed that this device absolutely avoids accidents from cranking. A noted engineer is said to have said, after a thorough test, that it is entirely satisfactory, also that he has tried it repeatedly with sparks fully advanced, and although the motor would kick back, the starting handle would release without any inconvenience to the operator. It has been stated that the average general automobile accident involves about double the general disability from ordinary accidents, and that the most prolific cause of the trouble is cranking, which is responsible for half of the accidents. This is shown by the following table, based on the statistics of several automobile companies:

Cranking	49.2	per cent.
Collisions	13.1	" "
Thrown from auto or ditched	14.8	" "
Getting on or off	5.0	" "
Machinery	5.0	" "
Miscellaneous	13.0	" "
Total	100.0	" "

* * *

A visit by railway officers to the exhibit (Booth 502) of the Union Fibre Company, Winona, Minn., is well worth while. J. H. Bracken and S. E. McPartlin are busy showing the Linofelt refrigerator car lining which has just been specified for use on the 1,450 Pacific Fruit Refrigerator cars now being built at the Pullman shops at Pullman, Ill., and the 500 Great Northern refrigerator cars now being built by the American Car & Foundry Company. Copies of a recent work on "Car Refrigeration," by Mr. Bracken, are being given to railway men. Opinions by leading fruit raising and shipping experts are a feature of this excellent publication.

* * *

If you have as much trouble as most roads have experienced when receiving foreign passenger cars on account of the steam hose couplers not coupling properly, it will pay you to inspect the No. 800 two-piece coupler on exhibition at the booth of the Gold Car Heating & Lighting Co., New York. This coupler will take any hose from 1¼ to 1⅝ inch (inside diameter) and is so constructed as to admit gaskets with 1¼, 1⅜ and 1½ in. opening; thus coupling with small and medium size couplers of other makes.

* * *

The National Malleable Castings Company of Cleveland, O., has a larger exhibit this year than ever before. The company recently acquired the Latrobe Steel & Coupler Company, whose well known product has for years been an important factor in the development of the automatic car coupler and high-grade miscellaneous castings. The organization heretofore in charge of the Latrobe plant has been retained by the new owners. The main feature of the exhibit is the "Sharon" coupler. It embodies not only the latest recommendations of the M. C. B. Association, but presents features which demonstrate that the Sharon may be successfully operated by any type of uncoupling mechanism. An important feature looking to possible future requirements is the composite design, with interchangeability of all parts within the head so that the coupler may be made to operate from the top or bot-

tom. This interchangeability permits the use of one design of coupler head in all classes of service—freight, passenger, locomotive and tender. In the construction of the Sharon coupler the well known knuckle throwing feature, which has for so many years made the "Tower" coupler a popular favorite, has been preserved.

* * *

Anti-Pluvius puttyless skylights, made by the G. Drouvé Company, of Bridgeport, Conn., were used on the machine shop of the Boston & Albany at Springfield, Mass., described in the *Daily Railroad Age Gazette*, June 18.

* * *

That business is in no torpid state is nowhere more conspicuously demonstrated than by the activity of many railroad supply concerns. The Kennicott Water Softener Company, Chicago, for example, has received 40 orders for water softeners alone since January 1 last. The average capacity of these machines is over 7,000 gals. an hour. An order taken last November, and not included in the above, is for the largest single steel tank machine in the world. This is now being installed for a Milwaukee leather manufacturer and has a capacity of 150,000 gals. per hour or 2,500 gals. per minute. The big steel tank, 45 ft. in diameter and 75 ft. high, is a fine example of the high grade of work put out by this concern.

* * *

The Buhoup cast steel truck side frame exhibited by The McConway & Torley Company, Pittsburgh, Pa., is attracting much attention. This frame is adapted to trucks of the arch bar type, and its distinguishing features are simplicity of design, and the ease of assembling, removing and replacing bolsters and making repairs. It is a one-piece frame requiring no supplemented bottom tie bar and no nuts on bolts.

* * *

The Joliet Railway Supply Company, Joliet, Ill., is showing something new in the shape of a one-piece triple strut for Huntoon brake beams. The strut is attracting almost as much attention as the Perry side bearings that have been in service on the different lines throughout the country. It is said that one of these struts carried one of the 240,000-lb. cranes of the Pennsylvania for four years.

* * *

Jenkins Brothers, as usual, are exhibiting their well known "96" packing in addition to a new medium pressure gate valve for pressure of 150 lbs.; also an extra heavy gate valve for pressure of 250 lbs. and for superheated steam.

* * *

The Garlock Packing Company took a number of its many friends sailing on the yacht "Olga" Thursday, Friday and Saturday last.

* * *

One of the unique and interesting features of the convention is the Thurman portable electric vacuum cleaner in operation. Manager A. R. Thomas, at booth 208, and his assistant, Miss Clara Landy, offer to brush the clothes by the vacuum process of interested visitors as well as to demonstrate the most approved method of cleaning the home, passenger cars, public buildings, etc., as advocated by The General Compressed Air & Vacuum Machinery Company, of St. Louis, Mo.

* * *

The American Vanadium Company, Pittsburgh, Pa., space 211, is distributing a report, and the discussion, of a paper, entitled "Vanadium, Its Services in Railway Steels," which was presented before the Railway Club of Pittsburgh by J. Kent Smith.

* * *

The Wheel Truing Brake Shoe Company, Detroit, Mich., has just issued a new, convenient size, pamphlet on the subject of wheel truing brake shoes. These wheel-truing brake shoes are designed for removing flat spots, cutting down long flanges, reducing double flanges and generally truing up car and locomotive wheels, and this without taking the equipment out of service.

* * *

Bartley fasteners, made by the American Nut & Bolt Fastener Company, Pittsburgh, Pa., are being used on the cars for the Manchurian Railroad being built by the Ralston Steel Car Company. The American Nut & Bolt Fastener Company have an exhibit in space 330. Milton Bartley, president of the company, is here.

* * *

Somebody asked what William W. Whitney, purchasing agent of the Cambria Steel Company, has been doing since he has been here. The answer was that there isn't anything he hasn't done that can be done in Atlantic City. That includes a few.

* * *

Henry Gulick, president of the Gulick-Henderson Company, Pittsburgh, Pa., spent Monday among his friends at the convention.

* * *

An entirely new construction in curtain fixtures is being shown in booth 445 by the Planet Company, Chicago. The device has a vertical pinching arrangement and locks on the sides of the grooves instead of a pressure against the posts. This places the releasing lever in a natural position, and it does not require the twisting of the wrist or the arm to grasp it. The design is neat and it should be carefully inspected by all interested in curtain fixtures. The Summer's vestibule curtain hook, which has been adopted by several railways, is also being shown. The company is represented by Thomas P. Convey, who is always on hand to show the goods.

* * *

The "minutes at a glance" watch dial, manufactured by the Ferguson Dial Company, Monroe, La., is an exhibition at the booth of the Commercial Acetylene Company, space 210-9. L. B. Ferguson, president of the company, is master mechanic of the Vicksburg, Shreveport & Pacific.

* * *

The Independent Pneumatic Tool Company, Chicago, Ill., makes the "Thor" wood-boring machine, shown in the illustration. It is made in three sizes and they cover the entire range of work for which they were designed—the light No. 6 reversible machine, for bottom work up to one inch; the 15-lb. No. 5, for general work up to two and one-half inches, and the large No. 14, for heavy work up to four inches. These tools are sent out for test on approval.

* * *

Although the General Electric Company, Schenectady, N. Y., has no regular exhibit of shop motors at this convention, the company's product of this nature is well illustrated in the motors and controlling devices used in a majority of the machine tool exhibits. There are 22 general electric motors, ranging from one-h.p. to 20-h.p., operating tools exhibited by 11 different manufacturers. These motors are located as follows: American Tool Works Co., one 5-h.p. and one 15-h.p.; Charles H. Besly & Co., one 15-h.p.; Brown & Sharpe Mfg. Co., one 20-h.p. and one 15-h.p.; Bullard Machine Tool Co., one 7½-h.p.; Manning, Maxwell & Moore, one one-h.p., two 2-h.p., one 3-h.p. and one 5-h.p.; Newton Machine Tool Works, one 7½-h.p.; Niles-Bement-Pond Co., one 10-h.p.; Joseph T. Ryerson & Son, two 2½-h.p., one 7½-h.p. and two 3-h.p.; Stoever Foundry & Machine Co., one 3-h.p.; Watson & Stillman Co., one 1-h.p. The General Electric Company manufactures both a.c. and d. c. motors from $\frac{1}{16}$-h.p. up, both variable and constant speed types, adapted for operating of all classes of shop equipment and the large and varied use of these motors on machinery exhibited at this convention is a good indication of their recognized superiority.

* * *

The Excel Coupler, which the Scullin-Gallagher Iron & Steel Company, St. Louis, Mo., is exhibiting in spaces 103-111.

has recently been re-designed and now combines all the desirable features necessary in an article of its kind. This coupler is said to be made of the best quality open-hearth basic steel, properly annealed, and designed to meet all the M. C. B. requirements, also permitting the use of an emergency knuckle. The lock, lock set and knuckle opening appliances are self-contained and positive in their action, and as the leverage principle is employed no inclined surfaces are required to open the knuckle. The pulling and buffing strains against the knuckle are taken up through massive lugs engaging in slots in the coupler head, no knuckle pivot pin being used. Air hardening tool steel inserts are cast in the head to obtain the minimum amount of wear. The lock, which is made in one piece and is free from creeping, is rectangular in shape, providing large bearing surfaces against the knuckle and head, also practically closing the opening in the head. This, in addition to the snug-fitting lock cap, prevents snow, ice or dirt from entering the coupler, thereby rendering the parts inoperative.

* * *

The Carter Iron Company, Pittsburgh, Pa., shows a few samples of high grade iron, representing staybolt and chain cable iron, as furnished to the Boston Navy Yard, and tests required by the Bureau of Construction and Repair of the U. S. Navy, such as cold, drift, split and nick bends. The concern's high grade iron is made from Virginia limonite ores, the mines of which it owns and operates in connection with its blast furnaces at Ivanhoe, Va. The company also operates two rolling mills, one at Paden City, W. Va., and one at the works of the Monongahela Iron & Steel Co., Pittsburgh, Pa.

* * *

The Lovell window operator, made by the G. Drouvé Company, of Bridgeport, Conn., has been ordered for the new large locomotive erecting shop of the Lackawanna at Scranton, Pa.

* * *

H. M. Perry, of the Joliet Railway Supply Co., Joliet, Ill., was very much pleased the other day to learn that a large eastern railway had tested and accepted the Huntoon standard freight beam, rated at $\frac{1}{16}$-in. deflection at 10,000 lbs. The road's service requires a beam to withstand 12,000 lbs. at $\frac{1}{16}$-in. deflection. This proves the statements of the Joliet Railway Supply Company that the Huntoon beams are all rated below their actual capacity.

* * *

"Sanford," the Angora goat of prize breed which was delayed in arriving at the convention last June, has duly made his appearance this year in the exhibit of L. C. Chase & Company, Boston, Mass. It is interesting to know that although the breeding of Angoras in their home in Asiatic Turkey has been for centuries most jealously guarded, the animals are now raised in this country; and it is from their lustrous coat that the well known Chase's "Goat Brand" car plushes are produced. In their exhibit Messrs. Chase & Company show a great number of new patterns in frieze effect, and a full line of plain plushes in high and low pile. Their new grade of extremely low pile fabrics called "Royals," in both plain plush and in patterns, is attracting much attention.

* * *

The Cienfuegos, Palmira & Cruces, Electric, Cuba, is in the market for two, 30-passenger motor cars and four flat cars. This road recently closed a contract with the U. S. Steel Corporation for 5,000 tons of rails. Thornton N. Motley & Co., 50 Church street, New York, represent this road in the United States. Mr Motley is stopping at the Shelburne.

* * *

The Salt Lake & Los Angeles, operating a steam road between Salt Lake City and Salt Air Beach, and the Salt Lake & Ogden have each bought, during the past year through the Salt Lake City branch of Fairbanks, Morse & Company, generating units for electrically lighting their trains. The motive power is supplied by "A. B. C." vertical enclosed self-oiling steam engines, having extended sub-bases for the direct connected generator. A similar outfit may be seen in operation in the American Blower Company's exhibit space, No. 403, Annex court. Both of the above named railways have expressed complete satisfaction with the device.

* * *

The Duff Manufacturing Company, of Pittsburgh, Pa., has a "Duff-Bethlehem" forged steel hydraulic jack in its booth. This is the latest type of jack made entirely of forged steel, Its weight is only about one-half that of any other jack of the same capacity. Messrs. Johnson and Edgin are showing a cross section of this jack.

* * *

The National Lock Washer Company, Newark, N. J., is exhibiting at booths 20 and 22 in the main building its new dust proof and anti-rattling sash device, which fills a long felt want. It eliminates a great many difficulties that are now experienced in car windows. It positively prevents all binding from any cause, such as swelling from dampness and irregularity of posts, etc. In stripping coaches in shops it is not necessary with this appliance to restore the same sash to the identical opening, a feature that will be much appreciated by shopmen. In addition, all planing or cutting down to make a fit is done away with. The device is automatically adjustable to any variance in steel or wood work and can be applied to old as well as new cars, with either steel or wooden sash.

NATIONAL CAR CURTAIN FIXTURE.

The car curtain fixture, manufactured by the National Lock Washer Co., Newark, N. J., which is seen at its booth, is up to the standard of the other articles manufactured by this company.

It is a pinch handle fixture which cannot creep. The heads are stationary, and cannot be drawn out of grooves when finger pieces are compressed, as is the case very often with other fixtures, causing great annoyance to the passenger when trying to get it back in the grooves.

A very strong tension can be put on the spring roller, so with fixture locked at the bottom, the pull all comes on the curtain, causing it to set perfectly smooth. The strong tension on the roller also insures quick action when the curtain is raised, and holds it firmly when the wind is blowing.

STANDARD COUPLER COMPANY.

The Standard Coupler Company, New York, is showing in booth 339 Sessions-Standard friction draft gear, types C and K; high capacity steel platforms and buffers; a sustaining valve for air-brake cylinders, and two types of brake slack adjusters. The high capacity buffers provide for a long, easy movement in coupling cars, and a high ultimate capacity, insuring the buffers being at all times held firmly together under excessive movements of the draft gear, and provide for equalization of the pressure on the buffer when cars are rounding curves and crossovers. The capacity is about five times greater than ordinary practice.

The sustaining valve for air-brake cylinders is for use on grades and is screwed onto the exhaust port of the triple valve. It sustains the air pressure against ordinary leakages during release of the brake and recharging the reservoirs. If the leakage becomes excessive, however, it automatically cuts out.

One of the brake slack adjusters is put between the truck levers in place of the bottom rod, and takes up the slack due to brake shoe wear. It maintains a uniform piston travel in the brake cylinder. The other slack adjuster is attached to the brake cylinder, likewise maintains a uniform piston travel,

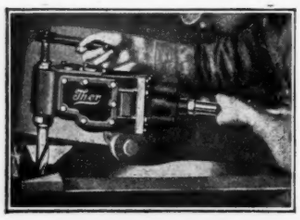
and takes up all slack in a single application, enabling all adjustments of brakes to be made at the terminal.

"A. P. M." MATERIALS.

An entirely new departure in passenger car paneling, headlining and insulation is the asbestos protected metal headlining and special interior finish. The material is composed of a sheet of steel hermetically sealed within a coating of special waterproof and fumeproof compound. In this compound is firmly imbedded on both sides of the sheet a layer of pure asbestos felt. The asbestos surface of the material is specially treated by the manufacturers in such manner as to render it susceptible to a high finish in imitation of wood panels or veneer, as well as in solid colors, bloss tints, white enamel, etc. It is claimed for the "A. P. M." headlining that it cannot warp, blister, crack or break; that it is not affected in any way by leaking car roofs, or by climatic changes, that it can be sprung into position with nature's tools—the hands—and where fitting is necessary may be trimmed with a pair of trimmer's snips; that it is light in weight, fireproof, fumeproof and waterproof, and can be installed at the lowest possible expense. Samples of the "A. P. M." headlining and interior finish are shown at booth 353, Exhibition Hall.

THOR CLOSE CORNER AIR DRILL.

The new No. 9 Thor close corner air drill, made by the Independent Pneumatic Tool Company, Chicago, Ill., is meeting with as much approval as their No. 8 drill, with which all are familiar. The new machine is equipped with a No. 4 Morse taper spindle and operates within $1^{9}/_{32}$ of an inch from a corner. The tool only weighs 30 lbs. and will drill up to 3 in., reaming and tapping up to 2 in. The cut shows the No. 9 drilling tie-brace bolt holes on locomotive frames, and its adaptability to close quarters is well illustrated. The company makes it a practice to send these tools out on approval.



No. 9 Thor Close Corner Air Drill.

GOULD NO. 950 TYPE M. C. B. FREIGHT COUPLER.

This coupler, made by the Gould Coupler Company, Depew, N. Y., has been improved and strengthened to meet modern requirements of heavy equipment. The vital features are a large locking face to the knuckle, and its being impossible for the lock to creep up. This lock is of the vertical pivoted gravity type and does not require a spring back of it. The spring which is used assists the gravity action and makes the lock set quicker in coupling in service at the impact of the opposing coupler. The spring also prevents any hitching up action in service, and of the thousands of couplers of this type in service it is said that no complaint as to their unlocking in service has ever been made.

This coupler has an opening knuckle device which operates as soon as the lock is raised to release the knuckle, no further movement of the lock being required. The device, which is positive, easily accessible, and not liable to get out of order, is placed in the bottom portion of the coupler, making it visible and accessible. A lockset is also provided.

These two devices are a convenience in making up trains, but they are not in operation, nor are they necessary when the cars are in transit, but the absolute security of the lock is vital. In this coupler preference has been given to the security of the lock, as in the confined limits of a coupler head it is not mechanically possible to make all three devices—the knuckler opener, lockset and a large abutting face on the lock—absolutely perfect.

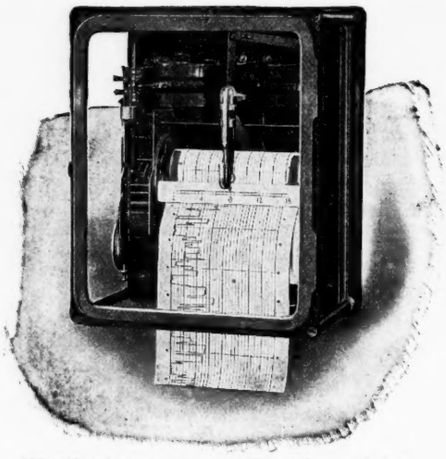
The knuckle has shoulders which engage stop lugs or abutments on the ears of the coupler for decreasing the leverage of the knuckle on the pivot pin. The leverage is decreased nearly one-half, and prevents bending of the knuckle ears on account of buffing shocks, increasing the life of the knuckle and keeping it in alinement. A hook on the end of the knuckle engages a heavy rib on the inside of the head, relieving a portion of the strain on the knuckle pin. The knuckle will remain in its proper relation to the coupler if the knuckle pin is broken or removed. This has been proved by removing the knuckle pin during tests under the drop-testing machine. The lock is complete and easily removed by the withdrawal of the flat cotter key.

HOW GRAPHIC RECORDING INSTRUMENTS SAVE WASTE.

The exhibit of the Westinghouse motor and curve-drawing meters connected to various machine tools has attracted attention because of the possibilities which it affords of detecting waste and delays in shop methods, previously known to exist.

As an example of a saving which the use of these meters produced by indicating a source of delay, the following case may be noted.

A comparison of records obtained from lathes which were roughing out motor shafts showed that in one there were stops averaging five minutes each while the shaft was being taken out and a new one put in, or a shaft half completed was being reversed in position; while in the other the delays averaged 10 minutes. It was found that the shorter time for changes and reversals occurred on a shaft small enough to be handled entirely by hand, but the other shaft was so heavy as to require the services of a crane in handling. The delays were due to the impossibility of obtaining the overhead traveling crane at once.



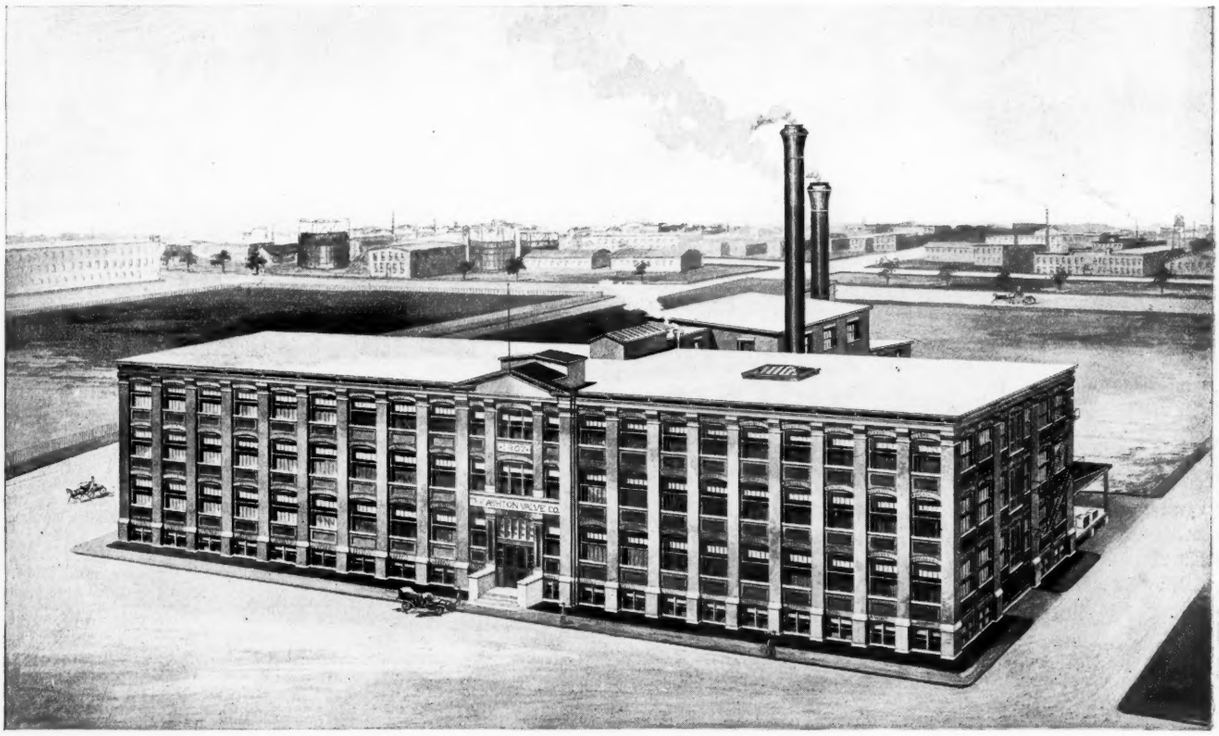
Westinghouse Curve Drawing Meter.

To remedy this defect, a jib hoist was installed beside the lathe and the material was handled in and out of the lathe by the hoist. The result was a saving of 10 minutes on the time of each shaft, which amounted to 20 per cent. and meant the completion of two more shafts a day.

Similar delays exist in every shop and go on for years without being detected because they are small and escape notice. There are so many reasons why the machine tools must be shut down that it occasions no inquiry when a tool is seen not working. Hence it is only when a graphic log of all the operations is put before him that a foreman can detect the weak points in his shop system, and then go ahead and correct them.

ASHTON VALVE COMPANY'S PLANT.

The accompanying cut shows the new factory buildings of the Ashton Valve Company at 161-179 First street, East Cambridge, Mass. The main building is 200 ft. long and 50 ft. wide, three stories and basement. The basement contains a fireproof pattern storage room, blacksmith department and general stock room for rough brass and iron castings. The office, tool room, pattern shop and shipping department are on the first floor, while the second floor is given over to the valve manufacturing department and valve buffing room. This floor opens to the second floor of the boiler house, where the work of valve testing is done. The third floor is devoted entirely to gage-making, including buffing and nickel-plating. The foundry measures 60 ft. x 30 ft., and the boiler house is 50 ft. long and 30 ft. wide. The latter is equipped with two water tube boilers, one especially for testing purposes and capable of carrying 400 lbs. steam pressure. All the buildings



Ashton Valve Company's Plant.

are of brick and concrete slow-burning mill construction. All machinery is driven by electric motors operated on the group-drive plan, and the buildings are all lighted by electricity. Special attention has been given to lighting in the daytime working hours, all buildings having been fitted with as many windows as strength would permit. The most improved sanitary arrangements have been installed on a liberal scale.

The business of the Ashton Valve Company was established in 1872. The plant of the company, at 271 Franklin street, Boston, has been dismantled, but one floor has been retained for a city office. The company makes muffler and open pop safety valves, blow-off valves, locomotive steam gages, duplex air gages, gage testers, air-brake inspectors' test gages, locomotive chime whistles and dynanometer recording gages.

The T. H. Symington Co., Baltimore, Md., has on exhibit a malleable iron journal box, with one of the side walls cut away sufficiently to show clearly the action of the lid spring in opening and closing the lid. This same box shows the new flexible dust guard, several thousand of which are already in service, and which, it is stated, are proving entirely satisfactory in meeting all service conditions. The superiority claimed for this form of dust guard over other guards is, briefly: Sufficient flexibility to readily adjust itself to every movement of the axle; combination of flexibility and endurance to stand an unlimited number of jackings of the journal box; and the entire exclusion of dust and dirt from the back of the box because of an effective joint at all times around the axle and all around the back opening into the box. The price of this dust guard, the Symington company states, is low in comparison with all other forms of patented dust guards.

UNDERWOOD VERTICAL BORING MACHINE.

This tool was originally built for boring and reboring automobile cylinders and similar work, such as air-brake cylinders, bushings, etc. It is, however, capable of work which would ordinarily require a large boring mill, such as the hubs of large gear wheels, fly wheels, etc. It operates quickly and does accurate work.

The principle of boring in a vertical position affords many advantages. The machine stands upon three legs, and is 3½ ft. high. The spindle carrying the cutterhead is 3 in. in diameter, driven by a Hindley worm and worm wheel geared 20 to 1. This revolves the oil in a dust-proof case. The feed screw runs through the spindle and is operated by a star wheel coming in contact with one or more knockers, located in holes in the lower face plate. These holes are on the inner and outer circumference of the line of travel of the star wheel, which permits a feed in either direction. There are six changes of feed to suit requirements. The hand wheel provides for rapidly lowering or raising the spindle, which has 18 in. of travel and a working length of 16 in., which still leaves sufficient bearing in the worm wheel casing for rigid operation. The bearings are amply large in both diameter and length to assure necessary stiffness of the spindle. The cutterhead screws to the latter, and is provided with four projecting tools fitting in dove-tail slots. They are set out

equally by a cone in the center of the head. The regular cutterhead is 3½ in. in diameter.

The cylinder rests upon three adjustable sliding blocks, which are planed true and at right angles to the spindle. After centering it is clamped firmly to the blocks. This centering operation requires no measuring, and is quickly and accurately done. The setting blocks in the cutterhead are expanded to fit the bore and the cutterhead is then screwed on the spindle, which is run an inch or so above the sliding blocks. The cylinder is set over it and then clamped to the blocks, being perfectly centered. The cylinders may be cast singly or together.

The spindle is graduated to show the length of travel of the cutterhead in blind cylinders where the work cannot be seen from above. One man can operate two or three machines, which require but little room and power. The floor space required for each is about 40 in. square, and in boring new work about 2 h.p., and in reboring 1 h.p. is sufficient. A counter-shaft and cone pulley with four steps 3 in., 5 in., 7 in. and 9 in. is regularly furnished, requiring a 2-in. belt. This machine is made by H. B. Underwood & Co., Philadelphia, Pa.

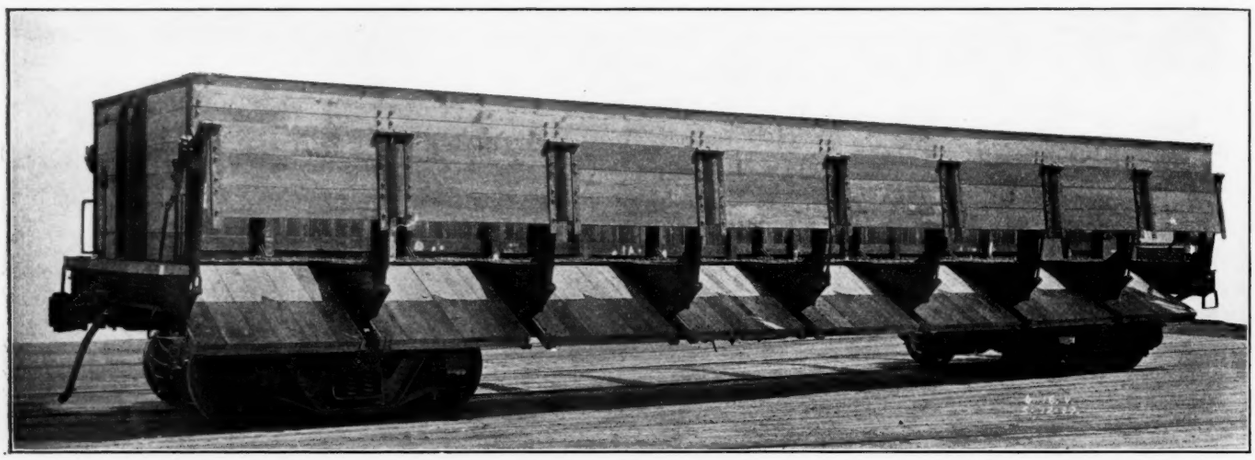
JOYCE-CRIDLAND JACKS.

The Joyce-Cridland Company, Dayton, Ohio, devotes its entire energies to perfecting and building lifting apparatus, and is at present turning out over 250 styles and sizes of jacks of every description. To show how well this company has succeeded in building jacks that fulfil the requirements of manufacturers, contractors, etc., and the consequent increase in its business which has resulted, it may be mentioned that the company was originally started in 1874, occupying one small room in a building in Dayton, Ohio. It was found necessary continually to move to larger quarters, and in 1905 the company erected the modern three-story factory which it now occupies. The present company was incorporated in 1893 and has been under its present management ever since that date. Among one of the most recent developments is an extremely light and convenient journal jack, which has met with favor from car inspectors. The hydraulic jack, with automatic speeding device, which has recently been offered, has also been favorably received, especially on account of its simplicity and freedom from complicated parts.

Joyce-Cridland Jack With Auxiliary Speed Device.

OSTERMANN SIDE AND BOTTOM DUMP GONDOLA.

A view of the Ostermann side and bottom dump, flush-bottom gondola car is shown herewith. It can be operated either from the ground or the end of the car, and it is claimed that the load can be dumped and the doors closed by one man, the car either standing or running, in 5 minutes. The side doors can be opened independently, dumping a part of the load, and the bottom doors then dropped, letting out the remainder; or all doors dropped at once, letting out the load at one time. The end doors can be dropped for convenience in loading long material.

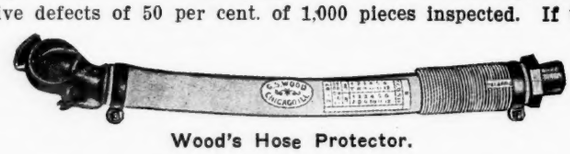


Ostermann Side and Bottom Dump Gondola.

The capacity of the car is 100,000 lbs. It will hold 1,855 cu. ft. with a 9-in. average heap, 1,560 cu. ft. level full, and 31 cu. yds. of gravel averaging 3,240 lbs. to the cu. yd. The door opening is 4 ft. 3 in. high. The Ostermann Manufacturing Co., Chicago, is the maker.

WOOD'S NIPPLE END HOSE PROTECTOR.

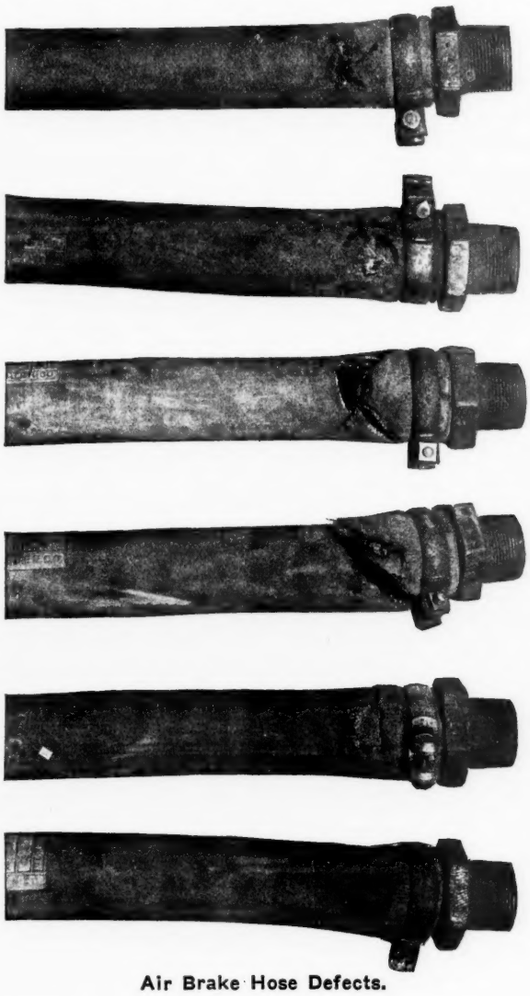
The great damage to air brake hose is done by abrasions at the brake pipe end, which so reduces the life of the hose that it does not average more than about 12 months from date of application. An inspection of a pile of scrap hose shows that about 50 per cent. of it has been damaged by abrasions at the pipe end; the accompanying illustration shows representative defects of 50 per cent. of 1,000 pieces inspected. If the hose is protected at the pipe end, the loss by chafing and abrasion will be so reduced that a saving of from 40 to 50 per cent. in air brake hose maintenance will be obtained.



Wood's Hose Protector.

The other illustration shows Wood's flexible wire covering, which produces the desired protection at the most vulnerable point. It is made of heavy steel wire and costs about 15

cents each. The wire coil makes the protector flexible, practical, indestructible and easily removable. It can be used on any standard make of hose. This hose protector is now used in large numbers by the Santa Fe, the Lake Shore, the Burlington,



Air Brake Hose Defects.

the Armour Car Lines and a number of other western companies. It is sold by Guilford S. Wood, Great Northern building, Chicago.

WESTINGHOUSE SELF-LOCKING ANGLE COCKS.

Accidental movement of the angle-cock handle is eliminated when using angle cocks provided with the Westinghouse self-locking handle, as illustrated herewith. The fact that nearly one million of these improved angle cocks have been furnished

Handle Raised.

is convincing evidence of the demand that exists for a practical and efficient means of locking the standard angle cock, in either open or closed position. In addition many railways have adopted these self-locking angle cocks as standard. In filling all orders for full sets of passenger or freight equipment, self-locking angle cocks are included without additional charge.

Because all the novel features are in the handle itself, which is interchangeable with the old-style handle now in service, it is possible to secure the advantages of the self-

Lock Closed Locked Open.

locking angle cock by merely substituting the self-locking handle.

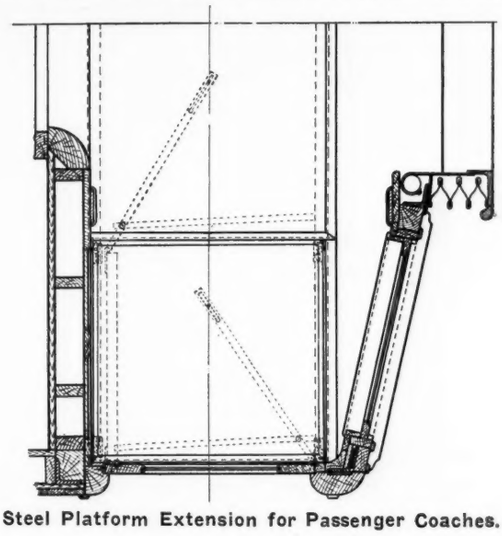
The Westinghouse Air Brake Co., Pittsburgh, Pa., proposes to establish a fixed minimum rate covering repairs to angle cocks, including the application of the self-locking handle, which it believes will be of special interest and importance to railway customers.

KING AUTOMATIC ALL STEEL PLATFORM EXTENSION.

The King Automatic Car Platform Co., 1407 F street, N. W., Washington, D. C., is placing on the market an improved all-steel automatic safety lock platform extension for passenger coaches, the essential features of which are safety, simplicity, durability and economy.

This platform extension is designed to meet all the requirements of the trap door, and in addition to supply a platform extension which will render wide vestibules suitable for local service, and meet the desire of railways for appliances which insure the safety of the traveling public.

An arm attached to the lower part of the car door operates



Steel Platform Extension for Passenger Coaches.

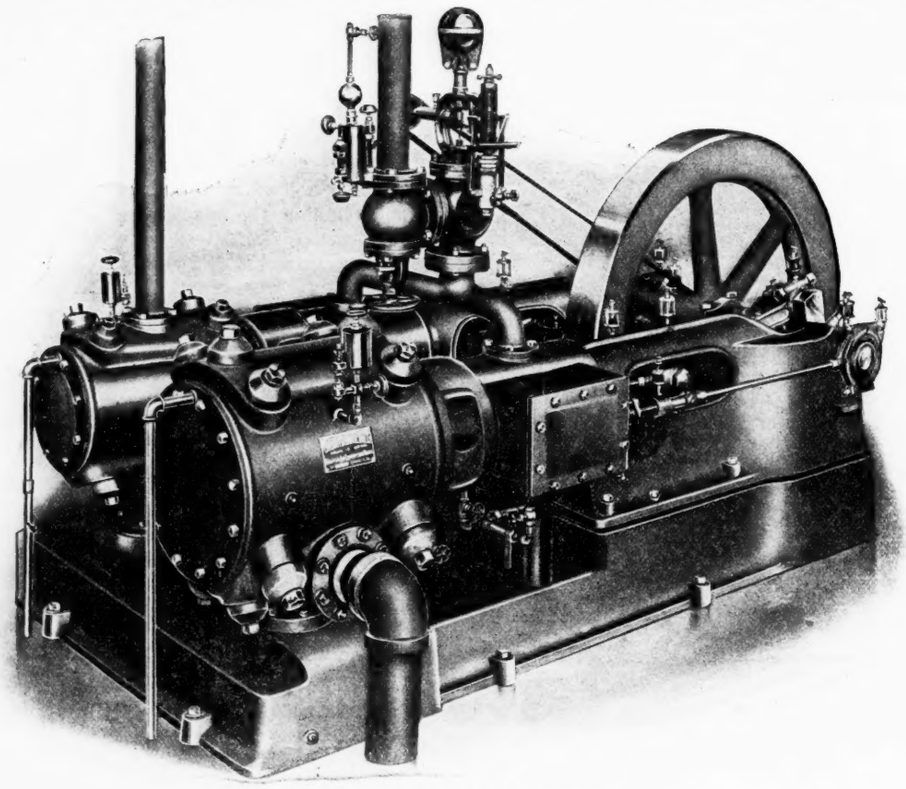
the platform extension automatically by simply opening and closing the car door either from the outside or inside of the car.

The platform extension slides on four rollers, and is held in place by four guide rollers attached to it. As the door is opened the platform extension slides open; as the door is closed the platform extension slides and closes, thus avoiding possibility of accident.

Being made of steel, stiffened by angle irons riveted to the under surface, distributed where most needed, it is light, strong and rigid. The plate presents a flat unbroken surface for the attachment of rubber tiling or matting. It retains its

shape and lasts the life of the car. There being no springs to get out of order, the factor of maintenance is practically eliminated.

For railways where some of the station platforms are on a level with the car platform, the same platform extension is provided with the door made in two sections, the platform extension being connected with the lower section of the door. By a simple mechanical device the platform extension is locked in its position and the upper section of the door allowed to open above it, permitting the passengers to pass out over the platform extension. When the upper section is closed it automatically unlocks the platform extension, engages the lower section, and is operated as a whole where the station platforms are below the car steps.



Type G, Franklin Air Compressor.

FRANKLIN AIR COMPRESSOR.

The Chicago Pneumatic Tool Company, Chicago, manufacturer of the well-known "Boyer" and "Keller" riveting and chipping hammers, "Little Giant" drills and Franklin air compressors, is exhibiting only an air compressor at the convention this season, owing to the fact these products are well and favorably known by the railway mechanical people. We illustrate herewith their type G, D. S. C., Franklin air compressor, fitted with duplex-steam cylinders and two-stage air cylinders and poppet valves. This compressor is located in the power-house on Young's Pier, where it is furnishing the necessary air for operating the various compressed air exhibits, including the exhibits of the New York Air Brake, Joseph T. Ryerson & Son, etc., etc. The machine referred to is of 419 cu. ft. capacity, compressing air to 100 lbs. pressure with 80 lbs. steam pressure. This type was designed to meet the demand for a simple and compact machine entirely self-contained and at moderate price.

A few of the important features of construction, appealing to mechanical men, are the following: Frames are of heavy box-shaped castings, graceful in outline, strongly ribbed, with large factor of safety to withstand strains and the bottom surface, bearing upon foundation through its entire length, insures stiffness, not only to the main bearings, but also along the guides and at the connection with the cylinder. The cylinders are made of a mixture of special iron and select scrap and are of sufficient strength and thickness to withstand, after reboring, the pressure for which they are designed. Pistons are of solid type, with cast-iron spring rings. The shaft is of center-crank type, of ample diameter, made of open hearth steel, with exceptionally heavy crank arms.

The box crosshead is provided with taper shoes turned to fit the cylindrical guide. These shoes have screw adjustment, affording a ready means for taking up the slight wear, and for securing proper alinement. Oil guards, at each end of the lower slide on the bed, give continuous lubrication to the lower shoe. The machine is provided with a pressure regulating governor to automatically control the operation of the compressor according to the demand for air. It is desirable that those interested should examine the machine in the power-house, where many strong features will readily be noted.

THE DOHLIN AUTOMATIC FREIGHT CAR DOOR FASTENER.

The particular advantage of the Dohlin automatic freight car door fastener is that the door fastens automatically. It is hard to compel railway employees to insert the pin in the usual style of hasp and staple, and the jarring of the car over the tracks results in the doors working open gradually, and with a large number of doors open and a side wind blowing the train resistance is considerably increased. In addition to this there is a great loss of doors in transit due to not being closed and fastened securely. This device is made of malleable iron and is so constructed that it can be as readily sealed as any other door fastener. It is for sale by the National Railway Devices Company, 400 Old Colony building, Chicago, and is on exhibition at booth 319.